Scientific American.

THE ADVOCATE OF INDUSTRY, AND JOURNAL OF SCIENTIFIC, MECHANICAL, AND OTHER IMPROVEMENTS

VOLUME XII. NEW-YORK, MARCH 28, 1857. NUMBER 29.

THE
Scientific American,

PUBLISHED WEEKLY
At 128 Fulton street, N. Y. (Sun Buildings.)
BY MUNN & CO.
O. D. MUNN, S. H. WALES, A. E. BEACH.

Responsible Agents may also be found in all the principal cities and towns in the United States.

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Single copies of the paper are on sale at the office of publication and at all the periodical stores in this city, Brooklyn, and Jersey City.

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Subdivisions of Chemistry.

The following extract from a recent lecture by Prof. Campbell Morfit, presents useful information in clear and comprehensive terms :

"Chemistry is that branch of knowledge which teaches the internal nature of bodies, explains the manner in which they re-act upon each other, and affords the means of rendering them available for many useful purposes to which they would be, otherwise, unsuited.

The grand practical division of modern chemistry is into organic and inorganic chemistry. The former, in contradistinction to the latter, relates to the study of substances having life, and existing according to the original formation by nature. A more critically exact classification would be into, 1st, Mineral chemistry, or inorganic chemistry proper; 2d. The chemistry of organized beings, which we so term because though now dead they have had their origin in a vital principle; and 3d, organic chemistry, comprehending those substances which have a present or very recent vital existence.

Analytical chemistry devises methods for detecting the various elements of a compound, and estimating their proportions. Synthetic chemistry enables us to form homogeneous compounds of dissimilar substances, and is sometimes used to verify the results of analysis. Assaying is analysis by the dry method, and without the use of liquid re-agents. Practical or applied chemistry consists in the application of chemical principles to the arts, for example, to the making and fixing of colors for paints or dyes, to the processes of bleaching, soap-making, distillation, brewing, pottery, and glass-making, and to culinary and domestic operations. It is more elegantly termed technical chemistry, and to this branch belongs also metallurgy, or the chemical arts of separating metals from their ores.

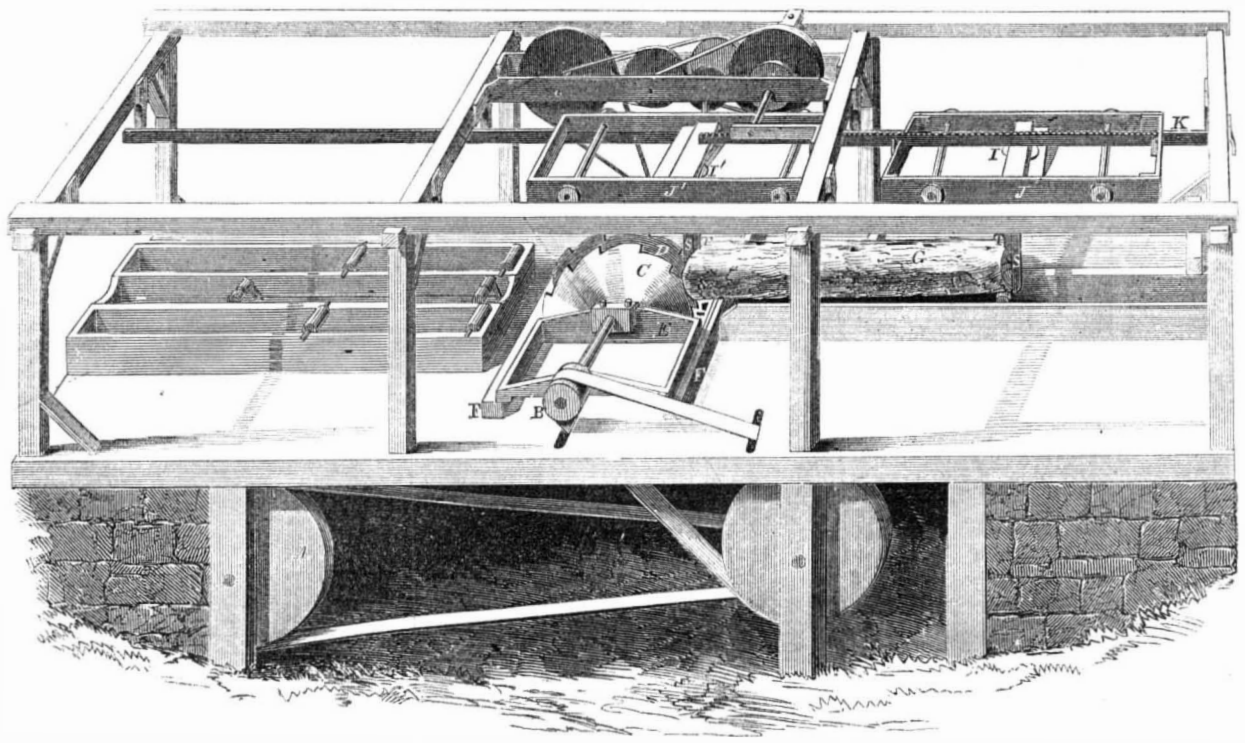
Pharmaceutical chemistry relates to the preparation of remedies employed in medicine. Medical chemistry is allied to physiology, and treats of the application of chemical principles and products in the theory and practice of medicine. Toxicological chemistry refers to poisons,—their special action upon the animal system, and the means of detecting them. Forensic chemistry embraces both of the latter branches, and assists in the legal adjudication of questions concerning life, health, and property.

The subdivisions in the science are many and increasing; and the varied uses to which it is now applied, for the convenience, economy, and profit of the world are so great, that even subordinate branches are growing or taking place out of those that had previously existed.

Legal Tender.

The following item from *Thompson's Bank Note Reporter*, may be new to some of our readers : "American gold coin in any amounts —American silver to the amount of five dollars—three cent pieces to the amount of thirty cents, and one cent pieces to the amount of ten cents are legal tender."

EGGLESTON'S IMPROVED SAW MILL.



The valuable invention here represented contains two principal features. Two circular saws are employed, and so arranged on sliding frames that they may be moved simultaneously in opposite directions, so that by allowing the saws to approach each other by the proper amount, after each board is removed, each saw is set to the log instead of the log to the saw, as usual: and two cuts are made at the same time on opposite sides of the log. The carriage for the log is also placed overhead, and the log ingeniously suspended thereto, so as to be out of the way, and not to interrupt the movements of the attendants about on the floor.

Fig. 1 is a perspective view of a whole mill, and fig. 2 a section of one of the elevated carriages, J. The same letters being employed to indicate the parts in both figures.

G is the log to be sawed, and C and D are the two circular saws, each mounted on independent arbors. Each arbor is mounted on a separate frame, E, which frame is carried on guide ways, F, in lines transversely to the axis of the log. Both the frame which carries C, and that which carries D, are provided with long racks, not represented, and these racks mesh into opposite sides of a small gear wheel not represented. This gear wheel is fixed on a shaft which is under control of the sawyer, and retained by obvious means in any required position. Thus, by turning this pinion, the saws, C and D, are moved toward each other, or separated at pleasure, and the sawing, which is commenced by removing a slab from each side, progresses further into the log as each sawed piece is removed, until there remains a piece of a thickness only equal to the thickness of the dogs, S and T, which hold the log.

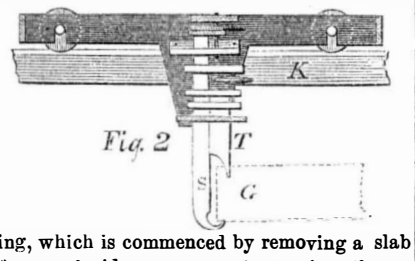


Fig. 2

These dogs, S and T, of which there are two pairs, one for each extremity of the log, are precisely similar, except that they face in opposite directions, and each pair is attached to separate carriages, J and J', which carriages run on the same track, K, and can be placed at any required distance apart, according to the length of the log to be sawed. Both carriages are moved steadily forward as the sawing progresses, by the usual means, as represented. By turning the hand wheels, I and I', easily reached from below, the dogs, S and T are made to release their holds on the stuff, and again to seize very firmly on the ends of a new log so soon as it can be placed in the proper position. Every facility is thus provided for working very rapidly and accurately, and the advantages arising from the arrangement are too obvious to require rehearsal. The invention was patented on the 3rd of March, inst., by Mr. Philander Eggleston, of Mobile, Ala., from whom any further information may be obtained.

Hydro-Steam Engine.

A large silk manufactory is being constructed in Newark to be driven by a water wheel, the water for which is pumped in a continuous circuit by steam. The pressure maintained on the jet of water is very great, and the wheel is a small and exceedingly well finished turbine, the diameter of which is only about one foot. The revolutions are consequently so rapid that instead of multiplying the speed in transmitting it to the shafting, as is usually necessary with all machinery of this description, whether impelled by water or steam power, it has in this case actually to be reduced. It is claimed by the inventor, Mr. Wm. Baxter, that the simplicity and economy of the steam pumping machinery employed, is such as to more than balance the waste in transmitting the power through the water wheel, and that consequently the power is produced and given off to the machinery at a less cost for fuel, and with less wear and tear of the machinery, as well as also more steadily, than in the ordinary steam engines. We shall watch the result, and refer to it again.

Endurance of Submarine Cables.

At a meeting of the Institution of Civil Engineers on January 27, there were exhibited portions of the submarine cables leading to Calais and Ostend, which had been ruptured during the recent gales by a vessel dragging her anchor, as described on page 213. The iron protecting wire had been twisted and ruptured by the force of the vessel hanging upon these cables successively, but the gutta percha covering of the copper wire was but little injured, and exhibited no ragged or disturbed condition, but only a a simple and clean break or section. The rest of the covering was represented to be in as good a state as when first laid down five and a half years before.

New Process of Tanning.

We have received from Edwin Daniels, of Elkhorn, Wis., a sample of calfskin "upper leather," tanned by a process for which a patent was issued to him on the sixth of January last. It is well tanned, firm, yet soft and elastic. No bark was used in preparing it, and the inventor informs us that the outlay for buildings and fixtures is just about one-tenth that of tanning with bark, only one vat being required for every ten used in the common process.

Catechu (old *terra japonica*) contains more tannin than any other substance employed in the manufacture of leather; hitherto, however, it has not been used for making the best qualities of leather, because it rendered the skins tanned by it brittle, and liable to crack. This defect has been overcome by Mr. Daniels, who employs it as the principal agent in his process, combined with the sulphate of aluminum, the nitrate of potash, and an acid, by which the skins and hides are "plumped" in a high degree, and the tannin made to combine with the gelatine in proper proportions to form soft and firm leather, susceptible of a fine finish, free from brittleness, and not liable to crack.

Catechu comes to us from India in the form of a concentrated crystalized extract; it has simply to be dissolved in warm water, and is then ready for use. Considerable machinery and apparatus, such as bark, mills, etc., required for bark tanning, are unnecessary for this process. Persons interested in the manufacture of leather will be furnished with samples by addressing Mr. D.

The Wethered system of combining superheated with common steam, an American invention, is now in use in the British Admiralty yacht *Black Eagle*, and also in H. B. M. steamer *Dee*. The officials report a saving of from 31 to 38 per cent in consequence.

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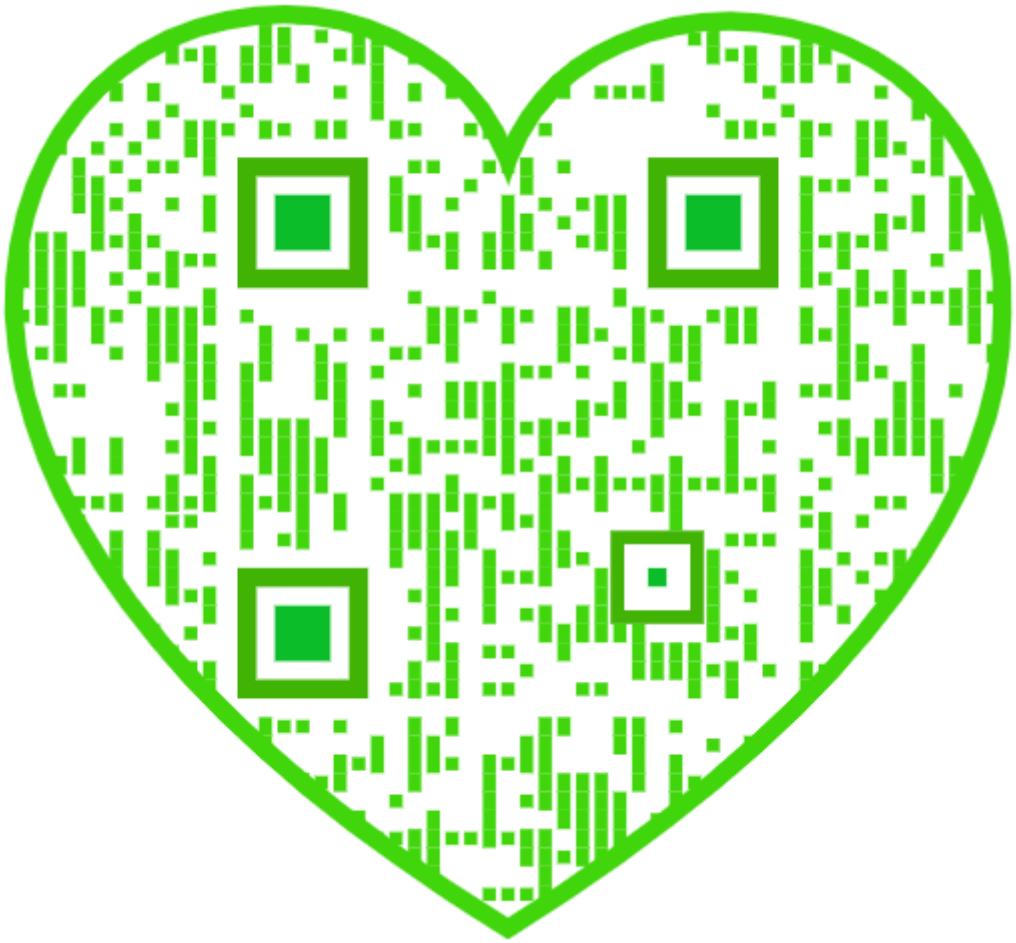

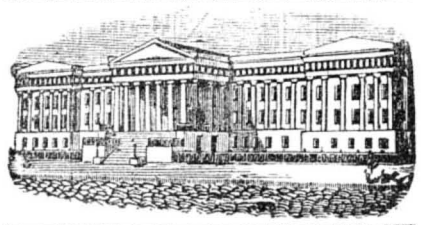

[Reported officially for the Scientific American.]

LIST OF PATENT CLAIMS

Issued from the United States Patent Office

FOR THE WEEK ENDING MARCH 17, 1857.

ENEMA-GIVING APPARATUS—B. T. Babbitt, of New York City: I do not claim, in the abstract, the employment of hydro tatic pressure, to give injections.

But I claim the combination of the portable reservoir, A, the flexible tube, c, and the nozzle, d, substantially as described, to form a portable apparatus for the purpose of giving enemas or injections by hydrostatic pressure.

[This simple improvement consists in giving a pressure to the fluid, by conducting it from an elevated reservoir. A sufficient hight is readily attained by suspending the reservoir from a nail or other fixture near the ceiling of a room. Its convenience can be readily appreciated.]

MACHINERY FOR FELTING HAT BODIES—J. B. Blakslee, of Newtown, and E. R. Barnes, of Brookfield, Conn.: We claim giving to the endless rotating bed of felting machines, periods of rest during the continuous motion of the upper deck, substantially as described.

POWER LOOMS—J. L. Cheney, of Lowell, Mass.: I do not claim supporting the picker staff by a rocker and horizontal rail or stand.

Nor do I claim applying to the picker staff, and its supporting bracket, a curved slotted guide and a roller, as the same is shown in Albert C. Williams' application for a patent.

Nor do I claim applying to the picker staff a spring for the purpose of retracting such a staff.

Nor do I claim applying to the rocker and its stand a spring to bring the rocker back to its place after having picked, and also to secure it to the rail while in the act of picking.

Nor do I claim making the striking point of the picker staff to travel in a straight horizonal line.

I claim my improved picker motion or mechanism as made with a guard stand and rocker, a stationary guide, Q, and a stud or roller, P, and with reference to the picker staff, I, substantially as described.

Also, so arranging the top bearing surface of the stand of the rocker that it may incline downward as specified, and so as to obtain all the advantages of a spring without the actual application or use of the same, meaning to claim such an arrangement of the top surface with respect to the rocker and staff, as an improved equivalent to the spring.

LARD LAMPS—I. N. Coffin, of Washington, D. C.: I disclaim the arrangement of flat inclined wick tubes at right angles to each other, that having been done by H. W. Revely.

But I claim the combination of the flat inclined wick tubes at right angles to each other, with the concave reflector, as described, for the purposes mentioned.

ROTARY PRINTING PRESS—J. C. Davis and William Miller, of Elizabeth, N. J.: We do not claim the separate parts of the machine as new.

But we claim the combination of the rollers, g g, with the shoes, l, 2, and the inclination of the ways, or planes, d d, and the upright screws, h, for operating the type bed, as substantially as described.

VENEERING THE WALLS OF BUILDINGS—George B. Field, of St Louis, Missouri, and Benj. F. Field, of Beloit, Wisconsin: We are aware that veneering of walls and buildings with iron and stone plates of itself is not new, and we therefore do not claim it.

But we claim the mode or manner described of securing these thin plates of slate or marble to the walls and ceilings of buildings which have been previously built, meaning the combined arrangement of the strips of wood, cement and screws, or the alternative method of the angle irons or window and door casings, pilasters,, cornice string courses, or other ornamental attachments, combined with the cement for the same purpose.

TELEGRAPHIC REPEATERS—M. G. Farmer, of Salem, Mass., and A. F. Woodman, of Portland, Maine: We claim the use of a mechanical obstacle essentially in the manner as set forth, whereby, when the independent circuit has broken the dependent circuit at the instrument, the dependent circuit is prevented from breaking the independent circuit.

BILL HOLDER—E. F. French, of Franklin, Vt.: I claim the pockets, B, placed between the two lids or covers, A A, the pockets and lids being connected by a cord, b, and having a rod or axis, C, passing through them at one end, substantially as shown and for the purpose set forth.

[The effect of this ingenious device is to very securely enclose and protect the bills when the holder is shut, and to plainly expose the endorsement on the back of each when the file is opened, so that the finding of any particular one is accomplished very readily. The cord, b, regulates the amount of motion allowed]

GAS GENERATOR—A. M. Giles, of Boston, Mass.: I claim the inner door, E, operating in the manner substantially as described, whereby the heat of the retort is rendered much more intense and uniform, as set forth.

Second, I claim the pipes, D, in combination with the inner door, E, arranged and operating in the manner substantially as set forth.

HINGE—Kingston Goddard, of Philadelphia, Pa.: I claim, first, the socket in the end or (adjusted to the end so as to form part thereof) of the hinge to be acted upon directly by a torsion bar, as specified.

I am aware that torsion bars are used in various ways to close doors, I therefore do not claim the torsion bar, but only the hinges as specified.

PIANOFORTE ACTION—J. A. Gray, of Albany, N. Y.: I do not claim the general arrangement of the action composed of the various parts, as shown, which is known as the French action, and in common use.

I claim the application of a spring to the hammer butt and jack-fly, causing the hammer to be so raised and kept, in position, that it will allow the jack-fly free play under the shoulder of the hammer butt, when the key is pressed down and the action in motion, as specified.

I also claim the application of the hook to the hammer butt and jack-fly, as herein described, so as to cause them to work together with more precision, and also to bring the hammer to its place after the key has been struck and released.

MACHINERY FOR CLEANING AND SEPARATING COTTON, WOOL, FUR, AND OTHER FIBROUS MATERIALS—Isaac Hayden, of Lawrence, Mass.: I claim, first, increasing the area of the trunk above the screen, or making it larger towards its rear end by increasing its hight or width, or both, as may be desirable, so that the blast of air which conveys the materials into or through the trunk will move gradually slower, so as to allow the light and fine, or such portions as are intended to be separated, time to be precipitated and pass through the screen, before the air, which holds them in suspension, escapes from or passes out of the trunk.

Second, And in combination with a trunk made gradually larger towards its rear end, as above claimed, I claim a screen of woven wire or twine arranged upon a series of partitions, as set forth.

MACHINES FOR STUFFING HORSE COLLARS—W. H Haworth, of Philadelphia, Pa.: I claim, first, the employment of two stuffers, stuffing against each other from both ends of the collars, when such stuffers are made to recede automatically as set forth

Second, I claim the employment of two alternating sets of such stuffers for stuffing both rolls of the collars, as set forth.

HERNIAL TRUSSES—A. J. Hardin, of Shebby, N. C. I claim the position and application of the lever, H, in the manner and for the purpose specified.

HARVESTERS—C. Halloway, of Petersburg, Va., assignor to J. B. Maney, of same place: I am aware many devices have been arranged for raising and lowering the cutters from the tongue of the machine. This I do not claim, independent of my special manner of accomplishing this end.

But I claim, in combination with the cam, P, connected to the frame by a link, Q, and to the tongue by a strap or yoke, the slot O, at front, and the lever connections, L M, at the rear, so that the machine may swing forward and back as it is lowered or raised, but be rigid when the draught is on, as set forth.

PRINTING PRESSES—Horace Holt, of Winchester, Mass.: I claim operating the "platen," G, by means of the cam, C, slide D, and arm E, connected with the platen by the rod F, and also operating the plate J, to which the form, I, is attached by means of the rod, e, connected with said plate, and made to bear against the face of the cam, when said parts are arranged as shown, or in any equivalent way, so that the platen, G, and form, I, may be operated conjointly by the cam, C, as described for the purpose set forth.

I also claim, in combination with the means above named for operating the platen, G, the rotating and vibrating ink-distributing roller, M, when operated as shown and described.

I further claim throwing the printed cards from the platen, G, by means of the levers, N O, attached respectively to the platen G, and plate J, arranged as shown and described, or in an equivalent way.

[This press is designed more particularly for printing cards, and as all the movements are derived from a simple motion of a cam, it is susceptible of being worked either by hand or by power.]

METHOD OF CLEANSING FIBROUS MATERIALS—John Howarth, of Salem, Mass.: I claim the described process of cleansing fibrous materials, as set forth.

BRICK MACHINES—A. V. Hough and R. W. Jones, of Green Castle, Ind.: We claim the use and application of two horizontal shafts, provided with oval or flanged wings, V, on one side, and arms or beaters, V, on the opposite side, in the lower perforated chamber, O, and in combination therewith, for the purpose of moulding and pressing the brick in the manner and for the purpose set forth.

HARVESTERS—M. G. Hubbard, of Penn Yan, N. Y.: I claim a shifting seat, when constructed, arranged and combined with a harvester, substantially in the manner and for the purposes set forth.

PHOTOGRAPHIC PLATE VISE—J. W. Jarboe, of New York City: I do not claim the employment of a cam to bring the moveable jaw up and to tighten it upon the work.

But I claim the combination of the screw, F, and its attached cam, G, with the moveable jaw, E, and the sliding piece D, the said jaw and sliding piece working in separate grooves or their equivalents, and the whole operating substantially as described.

[This novel arrangement enables the moveable jaw to be very readily and rapidly adjusted to any size of plate, and to be tightened upon the plate in a very expeditious manner. It will commend itself to photographers as one of the best and simplest devices for the purpose.]

COMPENSATING THE LOCAL ATTRACTION OF THE MAGNETIC NEEDLE ON SHIPS—Calvin Kline, of New York City: I claim the surrounding metallic ring or rings, r, or the modifiartions thereof, constructed, combined and arranged with the needle of a compass, substantially in the manner and for the purpose set forth.

FIRE ARMS—S. K. Lovewell, of Gardner, Mass. I claim the use of the spindle as above described, and in the manner above described, applied to guns of any size and calibre.

CONVERTIBLE CIDER MILL—Samuel Males, of Cincinnati, O: I do not claim as new any improvements in the separate machines.

But I claim rendering the machine readily convertible from a cider mill to a corn sheller, and vice versa, by making the concaves, D K l, hoppers, H, n, and cross beam, m, in the described form, the "cylinder" and driving gear being the same in both cases as set forth.

GAS BURNERS—John McHenry, of Cincinnati, O.: I claim the removable disc, e, as a means of varying the size of the throat of the burner, as and for the purposes set forth.

MACHINE FOR PLANING TAPERING STAVES—Valentine Munck, of Carrolton, La.: I claim the adjustable table, n, and n 2, and making said table guide the cutting head, t, substantially as and for the purposes set forth.

I also claim, in combination with the table, n and n 2, and cutting head, t, the angular side cutting heads, W 2, to secure from the variation of the table, n 2, tapered planing on the edges of the lumber, substantially as specified.

SEWING MACHINES—T. J. W. Robertson, of New York City: I do not claim the broad idea of pulling the cloth through a sewing machine, independent of any tool or contrivance for so doing.

Neither do I claim the broad idea of moving cloth by means of hooks in all kinds of machines, for an example of such a movement is seen in the weaving temple of J. C. Tilton, patented 1855.

But I claim feeding the cloth in sewing machines by means of a hook, having one or more points constructed, and operated substantially as described.

CAST IRON WHEELS FOR RAILROADS—J. M. Ross, of Springfield, Mass.: I claim nothing in Mr. J. M. Sigourney's mode of constructing his wheel.

But I claim my mode of constructing the plate, A, viz., by gradually increasing the thickness of the disc, as it recedes from the hub and tread of the wheel, in the manner and for the purposes substantially described.

FLUID LAMP BURNERS—R. W. Sargent, of Philadelphia, Pa.: I do not claim the burner tube, chamber A, the arrangement of the main wick or tube, a

I claim, first, the making of the chamber for the heating flame in lamps, in which burning fluid, spirit gas, or other highly volatile fluid is used, so that it nearly or wholly surrounds the chamber in which the gas is generated, in order that the heating flame being sheltered from the outer air and confined within the outer chamber, and in immediate contact with the inner chamber, may effect its purpose more steadily and with less consumption of fluid, the form of the outer chamber being substantially as above, and as represented in the annexed drawings.

Second, I claim surrounding the tube with a wick and packing, substantially as above described in order to supply the heating flame with fluid and the making of the burner tube with a flange and shoulder as described, in order to afford space for said wick and packing, and the perforating the burner tube with apertures, through which said wick may be supplied with fluid.

Third, I claim the regulator substantially as above described, moveable up and down upon the burner tube, in order to regulate and control the heating flame.

CUTTING AND BENDING SHEET METAL—Elliot Savage, of East Berlin, Conn.: I do not claim so applying the clamps and cutters to separate frames or a bow and half bow, that the cutters jointly be moved either towards or away from the clamps, without any disturbance of the positions of the cutters relatively to one another.

But what I do claim is constructing and arranging the frame which carries the clamps with respect to that which carries the cutters, substantially as described, that is so that while the clamps are being forced together or made to seize a plate of metal they shall not spread the cutters apart.

I also claim the mode of constructing the compound lever of the bending rollers, and arranging the rollers thereon, the said compound lever being composed of a bent lever and arm, and the rollers being applied to them respectively in manner as above explained

I also claim combining with the clamps, their crank shaft and the bending rollers, the auxiliary crank shaft, or equivalent means by which the bending roller, M, may be rotated independently of force applied through the clamps, and so that the middle of the metallic plate shall not be subjected to injurious strains by the bending rollers.

METALLIC SEALS—Joseph Wappenstein, of Philadelphia, Pa.: I claim a metallic seal, wafer, or fastening, for securing letters, packages, &c., composed of two pieces of the shape described, and united together, and to the thing to be fastened, substantially in the manner set forth.

RECIPROCATING CIRCULAR SAWING MACHINE—Osborn E Stephens, of McCall's Ferry, Pa.: I claim a saw arranged to traverse horizontally, so as to cut a score in one side of the log to be sawed, and then moved perpendicularly, so as to traverse horizontally in the opposite direction, to cut a score in the opposite side of the log, to correspond with, and cut into the first score, and cut off a portion of the log, substantially as described.

I claim the devices substantially such as are described, for changing automatically or by hand the motion of the carriage which traverses the saw horizontally in each direction, for the purposes set forth.

I claim the devices, substantially such as are described, for changing automatically or by hand the motion of the carriage that traverses the saw perpendicularly, for the purposes set forth.

I also claim the latches arranged to fill the scores in the guide, e, so as to let it slip by the locking lever, h, as described.

MOWING MACHINES—John Taggart, of Roxbury, Mass.: I do not claim a series of cutters in their application to grain and grass harvesters.

Neither do I claim a knife sharpener.

But I claim a series of rotary cutters working in recesses or guides, S S', in combination with a knife sharpener, T, when the said parts are constructed and arranged for operation in the manner and for the purpose as set forth.

GRADUATING CARPENTER'S SQUARES.—Heman Whipple, of Shaftsbury, Vt: I claim, first, the scale index, m, mounted upon the carriage, B, and regulating the extent of motion given to said carriage from the truck, r, and pusher point, whereby the length of the division mark is determined, and the cut made from the edge of the square, substantially as specified.

Second, I claim the arrangement of the rack, r, lever, k, and its actuating cam or pin, pawl, y, rod, n, and weight, x, or its equivalent, for moving and adjusting the index, m, to be acted on by the pusher, v, substantially as specified.

Third, I claim arranging the graver stocks, g, within the carriage, B, substantially in the manner and for the purposes specified, when said graver stocks are governed by the levers, L, adjusting rail, h, and springs and rods, S, or equivalents, for pressing down the gravers in cutting, and thus lifting the same up off the square while returning, as specified.

Fourth, I claim the arrangement of the scroll cam, D, anvil or bed, c, rod, a, lever, b, latch, i, inclined wedge, f, and clutch or friction lever, p, for moving said bed, c, and its square endwise the required integral part between each stroke of the gravers, and then stopping the machine when the divisions are completed, substantially as specified.

Fifth, I claim the manner of securing the gravers, e, in place, and bringing them to the exact position in the stocks, g, by means of the mortise bolt, 5, constructed and operating substantially as and for the purposes specified.

I do not claim regulating the extent of motion given to the graver stocks in drawing back by means of cams, as these have been used, it being understood that I do not claim a mortise bolt to secure a bar or tool, as this has before been used.

But I am not aware of any mortise bolt having before been constructed with the mortise for the tool eccentric, or one side of the mortise partially removed, so that the flat side of the graver is pressed to the side of the mortise in the graver stock, by the turning of said mortise bolt, and brings the same correctly to its position, irrespective of the thickness of the graver itself.

UNHIAKING ROPE OR CORDAGE—Joseph Wood, of Brooklyn, N. Y.: I disclaim the invention of the revolving roller head itself, and its use for any other purpose than that of unmaking rope.

But I claim the combination of the rotating roller head and the pointed mandrel, to operate in the manner and for the purpose set forth.

[This is a very valuable machine for performing the first stage of the reduction of old rope to the loose fibrous condition, in which it takes the name of "oakum," and is used for calking. The machine separates the strands by conducting the rope between rollers, the rotation of which in the head gives the rope a rotary motion in a direction opposite to the lay of the rope at the same time that it drives it upon the point of a mandrel.]

COMBS—Thomas L. Calkins, (assignor to himself and J. W. Bliss,) of Hartford, Conn.: I claim the use of the sheath, substantially as and for the purpose set forth and described.

PISTON FOR MUZZLE-LOADING GUN—John T. Foster and Jacob J. Banta, of Jersey City, N. J., (assignor to themselves and James H. Banta, of Piermont, N. Y.: We do not claim a piston actuated by a rod passing through the breech of the gun, as the same has before been used. But we are not aware that conical packing rings have ever before been applied to said piston for the purpose of cleaning and scraping off all scale and soilage from the interior of the gun, and delivering the same at the muzzle, and also providing for the instantaneous insertion into the barrel of the said packing rings

And we are not aware that the barbed fingers have ever before been applied to said piston to sieze and draw in the ordinary flannel cartridge, as specified.

We claim the conical packing rings, l l, on the piston, d, for the purposes and substantially as specified.

We also claim the barbed fingers, e, in combination with the piston, d, to sieze and draw in the ordinary cartridge, substantially as specified.

HAND PRINTING PRESS—Francis S. Coburn, of Ipswich, Mass., (assignor to W. W. Messer, of Boston, Mass., and Geo. F. Gray, of Albany, N. Y.): I do not claim combining the inking roller arm, F, and its spring, I, with a lever, K, applied to the frame, A, and the vertical shaft, c, and operated by the latter substantially as described.

But I claim the application or arrangement of the stops, M and b, and the spring, I, with respect to the frame, A, and the lever, K, and so as to arrest the upward movement of the roller, under circumstances as stated.

ROPE MANUFACTURE—Michael H. Johnson, of St. Louis, Mo.: I do not claim the condensing rollers.

Nor do I claim, of themselves, the bobbin and calender roller.

But I claim the combination of the condensing rollers with the callender roller and bobbin, as described, whereby the sliver may be condensed to a greater degree than is admitted under the ordinary circumstances governing the aforesaid manufacture with advantages as set forth.

PARING APPLES—Benjamin F. Joslyn, of Worcester, Mass.: I claim the spurs, j, either rotating or stationary, attached or connected to the cutter rod, and placed obliquely or angularly with the apple, or its axis of rotation, when said spurs are used in connection with a sliding mandrel, C, substantially as shown and described, for the purpose of feeding the apple to the cutter, as set forth.

[This is an admirable feeding device for parers. The spur wheel is set obliquely to the axis of the fork shaft, and by the rotation of the apple which it presses on, feeds it ahead without any necessity for other mechanism.]

BABY WALKERS—Joseph Thomas, (assignor to himself and C. A. Durgin,) of Brooklyn, N. Y.: I am aware that a circular cushion or annular table constructed in halves and hinged together to lock the child therein, and placed upon vertical vibrating springs, has been used in the patent of Euclid Rice, of Oct 28th, 1851; and I therefore disclaim the use of his invention.

But I claim the combination and arrangement of a circular cushion, having attached thereto straps, as described, for confining the child in a vertical position, and also allowing it to turn at will within the cushion, which is placed upon vertical adjustable legs, for the purpose of suiting the hight of the child, whereby I am enabled to make a cheap and useful article of furniture, protecting the child from injury and assisting it in walking, substantially as specified, and for the purpose set forth.

SCREW WRENCH—Benj. F. Joslyn, of Worcester, Mass.: I do not claim a hollow shank.

Neither do I claim a screw for operating the sliding jaw, irrespective of the arrangement shown.

But I claim the hollow shank, B, with the bar, F, of the sliding jaw, E, fitted therein as shown, when the parts are used in connection with the screw, G, placed within the hollow shank, and by the side of the bar, F, the screw passing through the projection, f, on the end of the bar, F, substantially as described, for the purpose set forth.

FIREMAN'S MASK AND RESPIRATOR—Israel P. Nelson, (assignor to himself and Geo. N. Davis,) of Cambridge, Mass.: I claim the described mask, with its tubes C, and valves, d, operating in the manner substantially as set forth.

COMBING WOOL—Michael H. Simpson of Boston, Mans Ante-dated Sept. 17th, 1856: I claim the combination and arrangement of an extra doffer L, and stripper M, or equivalents therefor, with the main card cylinder, the combing doffer, I, and the combing belt, N, the whole being substantially in the manner and for the purpose as specified.

I also claim the described improved arrangement and construction of the draft rollers, U V, with respect to each other and the combing belt, N.

I also claim making the wires of the fringe belt, W, to extend below the table, Z, and to run through a passage, c, formed between the part, Z, and the combing belt, or in the table, as specified.

I also claim combining with the curved plate, R, when such is employed in connection with the doffer I, and the combing belt, N, a steam heating chamber, S, or other suitable means of heating such plate, as set forth.

COMBING FIBROUS MATERIALS—Milton D. Whipple, of Charlestown, Mass., (assignor to A. B. Ely, of Boston, Mass.): I claim inclining the comb teeth to the axis of the cylinder, and covering them with the guard at the point of draft, in the manner substantially as set forth, for the purpose specified.

HARROWS—Sidney S. Hogle, of York, Ohio: I am aware that horizontal harrows have been so constructed that they could be rotated upon their axes.

I claim causing the forward movement of a pivoted horizontal harrow to impart a rotary motion thereto by means of the auxiliary action of a weighted roller, or its equivalent, upon one side or the other of said harrow, substantially as set forth.

RE ISSUES.

WEAVING PILE FABRICS—Erastus B. Bigelow, of Boston, Mass. Patent dated Dec. 18th, 1855: I claim, first, successively drawing the pile wires from the cloth by a latch or hook, substantially as described.

I also claim constructing and operating said latch or hook so that after drawing said pile wires from the cloth it successively delivers them to a carrier or other apparatus, which completes their movement, substantially as specified.

I also claim in combination with a latch or hook for drawing the pile wires from the cloth, a carrier or apparatus to successively receive said pile wires from said latch or hook, and transfer them to the fell of the cloth, substantially as specified.

And I finally claim the method of inserting the pile wires into the upper shed of the warps, while the shuttle is passed through the lower shed, substantially in the manner and for the purpose specified.

RUNNING GEAR OF CARRIAGES—Gustavus L. Hansknecht, of New Haven, Conn. Patent dated Jan. 13th, 1852: I am aware that carriages have been described where the pivot which connects the front running gear with the hind part or body thereof, is placed behind the fore axle, and combined with two segments of circles resting and sliding, the one on the other, and the center point of which rests over and some distance above the center of the front axle, and I therefore do not claim this as my invention.

But I claim first, the combination and arrangement of the pivot in the rear of the fore axle, and the segments with the perch and head-block or perch cross bar of carriages having perches, as described, or the equivalents thereto, for the purposes of enabling carriages to turn in a shorter space than by the common mode of coupling, with perfect safety.

Second, I claim the additional set of segments, or their equivalents, the pivot placed perpendicularly above the lower turning point, to be employed where the springs are fastened to the axle, and move with the same.

SAWING OFF LOGS—Cornelia Waterman, of Brooklyn, N. Y., (administratrix of Stephen Waterman, deceased, of Greenwich, Conn., assignee of Isaac D. Russell, of New York City). Patent dated May 19, 1843: We claim revolving a log or block while being sawed, in order that the pieces sawed off may be of uniform thickness on all sides, and the mechanism described, or its equivalent, for raising and lowering said block, that it may be sawed into pieces of any desired thickness without being removed for the machine, said block being centered but once in sawing up the entire log, substantially as set forth.

SUGAR WORKS—Noebert Rillieux, of New York City. Patent dated Aug. 26, 1843: I do not desire to claim the application of the vapor arising from one heated fluid to the heating of fluids contained in other vessels, if in such cases the fluid in the second vessel is not under a vacuum or partial vacuum.

I claim, first, the employment of a vacuum pan or pans, in combination with an evaporating pan or pans or boiler in which the saccharine juice or other fluid is evaporated under a pressure lower, equal to, or greater than the atmosphere, which last mentioned pan or pans or boiler, prepares the saccharine juice, etc, from the vacuum pan or pans, and at the same time supplies the necessary vapor from the saccharine juice, &c., to complete the evaporation or concentration of syrup, &c, in the vacuum pan or pans, as fully described.

Second, I claim the employment of a weighted throttle or other regulating valve in the main steam pipe, arranged and operating in the manner and for the purpose as described.

FORMING THE WEB FOR CLOTH OF WOOL, HAIR, OR OTHER SUITABLE SUBSTANCES WITHOUT SPINNING OR WEAVING—The Union Manufacturing Company, (assignees of John Arnold and Geo. G. Bishop,) of Norwalk, Conn. Patent dated Oct. 20, 1836. Extended by Commissioner from Oct. 20, 1850. Extended by Act of Congress March 28, 1851: We claim the mode of operation substantially as described, by means of which the slivers of the weft fibres are kept properly distended until their entire surface is in contact with the surface of the sliver of warp fibres, substantially as described.

Saw Mill Wheels.

At what angle should water fall on the wheel of an undershot saw mill, with 25 feet fall? And what size wheel should be employed to make 150 revolutions per minute when cutting? R. N. B. McL.

The angle must depend on the construction of the wheel, and may be a matter of discussion. It is really immaterial so long as the water is ranged so as to act fairly on the floats. The velocity of the water striking the floats under a 25-feet head is very nearly 2,400 feet per minute; and allowing your wheel a reasonable breadth of float, so that the water shall spend its force on points considerably inside the wheel, 5 feet 6 inches diameter will give you very near the speed desired.

The daily papers have asserted that the new style of valves tried on the *Adriatic* steamship have been abandoned, and that common balance puppet valves will be substituted, a change which will involve another long delay. We think this has not been absolutely determined on, but simply to commence making patterns for puppet valve-chests, anticipating a *possibility* of the final failure of the rotary valves. The condenser and other parts are to be quite extensively changed, and considerable time will be consumed.

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A Superior Washing Fluid.

MESSRS. EDITORS—I send you a receipt for making a superior Washing Fluid, which I have had in use over two years. There is no precipitate if prevented from freezing and properly made. In the following proportions it will not cost over three cents a quart:—

Dissolve 1 pound of sal soda in 1 quart of hot water, and add to it 4 quarts of lime water; when this setties pour off the clear. Next dissolve 3 ounces of borax in 1 quart of boiling water, and add it to the 5 quarts of clear water. When cold dissolve in it 2 or 3 ounces of pulverized carbonate ammonia. Put it in bottles, and keep it tightly corked.

This fluid makes strong, thick "suds," makes washing less injurious to the hands, and it cleans the clothes with less rubbing. Use 1-2 pint, or less, to about 5 gallons of water; put it, with some soap, into the tub of clothes the night before washing-day, or a short time before boiling the clothes. I think this chemical fluid, among the list of washing compounds, will take "the rag off the bush"—and clean it. TRENTON.

Trenton, N. J., March, 1857.

[Washing fluid made after the above recipe, we have no doubt, will be found an excellent article, and we are much obliged to our correspondent for it.

Many who are in the habit of using washing fluids do not appear to be aware of their nature and specific objects. Why should they be used at all in washing? We answer, simply to provide a slight excess of alkali to combine with the grease and dirt on the clothes. They should be sparingly used, at best, and wholly discarded in washing laces and fine linens.

Good soap suds of sufficient strength makes the best washing fluid for fine white textile fabrics. The chloride of soda makes an excellent fluid for whitening linen that has become yellow in color, and as a washing fluid is inferior to none.

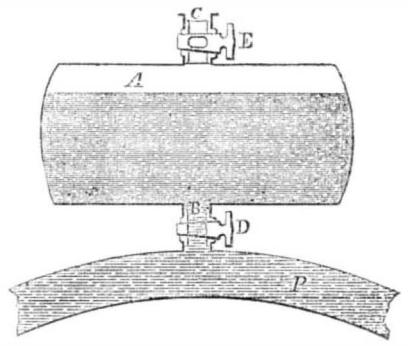
The use of strong caustic alkalies impart a yellowish tinge to fine linens and tends to injure them, and therefore should be used (if at all) with much caution.

Expulsion of Air from Aqueduct Pipes.

We hardly imagined when penning the article on page 208, that it would draw out so simple and admirable a remedy for the difficulty as the one below. We take this occasion to urge on our readers the importance of contributing their knowledge and experience to the great mass of valuable information we are trying to diffuse. If editors or correspondents hesitatingly make suggestions which you can either disprove or confirm by experience, we would cordially invite you to make the effort. Please consider yourselves each personally responsible for any errors in the SCIENTIFIC AMERICAN which remain uncorrected, or for any vacuities which remain unfilled. There is no country more filled with intelligence than this, and certainly no journal of a similar class in the world which has near so large a circulation. Our journal can by the co-operation of each reader be made to attain a degree of usefulness to which we can conceive no limit.

In the device below, although the vessel, A, is described as necessarily of considerable size and perfectly air tight, we conceive it need not necessarily possess either of these qualities to be of great service in many situations. By keeping the cock, D, closed until the air in the pipe becomes troublesome, the leakage of A is of no effect except during the few seconds while D is opened, and if small it will but require to be filled with water and emptied into the pipe several successive times. Even a steam cylinder oil cup and globe, with two cocks as usual, might serve a good purpose with a little care.

MESSRS. EDITORS—The collecting of air in aqueduct pipes, which was so well illustrated in your paper of the 7th inst., is a subject that has been a great puzzle to many, and a fact that has been the cause of a great deal of trouble. The object of this letter is to describe a remedy which is perfectly effectual. I will premise that the mode described by you, the upright pipe, is the simplest and cheapest of any, where it can be used, and where it can be protected from freeling. Another method which can be used to advantage when the bend where the air collects is below the level of the fountain, is an air cock. When the cock is opened, the pressure from the fountain head will drive the air out. But the most troublesome cases are when the pipe acts as a syphon, the air collecting above the level of the fountain; in such cases neither an open pipe or cock can be used, but a device of Mr. Daniel Cushing, a practical mechanic of Lowell, is the only one, I believe, that will answer the purpose.



P represents the aqueduct; A short pipe; B is attached to its upper surface; the upper end of B communicates with a vessel, A, of any convenient size or material; a ten gallon keg will answer, but a vessel of copper will be the most durable. A pipe, C, is inserted into the vessel. Its operation is as follows:—Close cock, D, and fill the vessel with water through cock E; then shut cock, E, and open D. Now, A being filled, all the air in P will rise into A, and the water of A will keep P filled until A is filled with air instead of water, when A must be again filled as at first.

This apparatus is cheap, simple and efficient, requires no other attention than an occasional examination to see if A contains air or water. If not attended to, it gives notice by the stoppage of the supply of water. It is perhaps needless to say that the work must be done air tight, and that the whole must bs protected from freezing. C. STODDER.

Boston, March 11th, 1857.

Growing Rubber in the United States.

MESSRS. EDITORS.—After a long interval of country life I again open a communication with you, my main object being to present to the American public through the medium of the SCIENTIFIC AMERICAN, the cheering intelligence that the question so long propounded, as to whether there was anything to be found in the wide expanse of our national domain that partook of the nature and characteristics of caoutchouc, or india rubber, may now be safely answered in the affirmative. I have the gratification of being able to state that the article not only exists in our country, but that is a commoh product in all of the States south of latitude 39°. I send you a small specimen of the substance, remarking that it is found in this country in a solid form, instead of the fluid or milky condition in which the ordinary rubber is found, consequently being in minute parts, cohesion of those parts can only be effected by the action of heated rollers, such as are used in all india rubber factories.

The specimen I send you is small and rather ragged, from the cause already stated, the cohesion in this case being effected by the action of a hammer with a heated plate of iron. From a very imperfect and unprofessional analysis I am led to believe that the physical properties of this article and the substance imported are identical. Without pretending to absolute accuracy in my results I think the approximation is C.87·2 H.12·8. The flame resembles the imported article as well as the smell and taste.

"Honor to whom honor" is a motto I sometimes find to fail in the application; lest some other persons should set himself forth as the discoverer of this American product, I shall invite the attention of such to the announcement I now make, and if any one has preceded me in the field, let the fact be known during the coming six months, or I shall take to myself the credit, if any be due. As I before stated, the growth of this substance is general, and though unlike the other, it can easily be reduced to a suitable shape for export or domestic use. JOSEPH E. WARE.

[The sample forwarded looks like the real caoutchouc, and exhibits the same elastic properties, but we do not detect any smell. If it differs from common rubber, it is, for aught we see to the contrary, as likely to be better as worse. Will Mr. W. give us further information?—ED.

Management of Root Crops.

MESSRS. EDITORS—The following plan of growing root crops may be new and useful to some of your readers. Say five acres of ground are to be planted with roots for winter use; prepare the ground early, plow deep to reduce it to a good tilt; harrow, and use it when wanted. In the meantime the weeds will start, but one hot day with the horse hoe will kill them. The land is now ready for sowing, which do, if possible, before rain. Mark out the rows regularly two feet apart for rutabagas, beets, turnips, less for carrots, before sowing; the lot should be restored, and the seed mixed with sand or mold a few days to start it. Get the best seed at whatever price: rutabaga and turnip will grow four or five years old if kept right. Break a few seeds—if dry, reject them, as no oil or vitality is left. But frequently the seed grows and is eaten off by the turnip fly in twenty-four hours, to obviate this, collect the weeds, &c., in three or four heaps at different points over the lot; look out for the wind to smoke your lot, by firing the heaps with the wind; in the evening the smoke will settle and check them. Horse hoe as soon as you can see your rows. You must not wait for the weeds to grow, as the soil requires to be constantly worked in dry weather to keep your plants growing, and they will soon cover the space between the rows. A good horse hoe and seed drill can be got at the agricultural stores.

It is easier to have five acres of roots, averaging twenty-five tuns per acre, than many of the half acre lots producing twenty-five bushels and any quantity of weeds to be pulled by hand, on the broadcast plan. If the lot is not all planted before August, sow turnips (with three or four barrels of bone dust applied at the same time,) or else have cabbage plants in reserve to fill up with. One man and horse will work five acres per day well; one man can set out one acre with the hand hoe per day, six or eight inches apart in the rows; if not sown too thick this is all the hand labor to be done. D. WATSON.

Newark, N. J., March 6, 1857.

Working of Cast Steel.

MESSRS. EDITORS—In addition to what has been said about tempering mill picks, in No. 27 of your valuable paper, I would remark—and a long experience justifies me—that the hammering of the instrument, be it what it will, with even perpendicular strokes, (the anvil and hammer being both hard and smooth) till the article is cold, improves the consequent temper very much. In forging the edge, thickening and shortening must be avoided, as this has the contrary effect of hammering.

Most tools must be tempered, that is, reheated to a certain degree after hardening, and then cooled again, and although the process is more or less familiar to all steel workers, the metal is nsually finished too soft. In tempering, the white natural color of the steel, rubbed bright, will change with the heat about as follows:—

No. 1.	White, tinged with pale yellow,	410°.
2.	Pale yellow	420.
3.	Yellow	450.
4.	Dark yellow	480.
5.	Brown yellow	500.
6.	Purple, tinged with yellow,	520.
7.	Purple	540.
8.	Dark purple	550.
9.	Deep blue	570.
10.	Light blue	590.

Nos. 1, 2, and 3 are good tempers for cast iron, steel, hard stones, &c. I should think No. 1 to be a very good temper generally for mill picks, as also Nos. 2 and 3 are hard enough for any stone if the steel has been treated well. Nos. 4, 5, and 6 are proper for cold chisels, punches, taps, dies, and tools for turning metals; for razors and good penknives, however, this temper is too soft. Nos. 7 and 8 are applicable to a great variety of instruments. Blacksmiths use this temper as a universal commodity—for everything. It is a very tenacious temper, but not very hard. Screw taps, if not intended for steel, turn out first rate; if for steel, Nos. 4 and 5 are proper, and hard enough. Nos. 9 and 10 is usually applied for springs, saws, and an innumerable variety of instruments requiring more elasticity than hardness. Parts and pivots in chronometers, clocks, good watches, and other machinery, come under No. 1. Nos. 1 and 2 is, for me, a most excellent temper, tenacious enough, and causing the edge to endure much longer than the softer tempers. H. Z.

Bloomsburg, Pa., March, 1857.

Night Spectacles.

MESSRS. EDITORS—In a recent article in the SCIENTIFIC AMERICAN you ask the question, "Why may not a pair of spectacles be made to see with in the night?" I have often asked myself the same question. It would be very desirable in some situations, to see clearly when quite dark, when acting as pilot, for exple, on a river steamboats. The idea is practicable. That which avails an owl to see in the dark will also enable a man to see in the night. Herschel could see with the aid of an optical instrument which he constructed, the dial on a steeple clock, a mile distant, when it was so dark that he could see but a few feet with the naked eye. The idea will be put in general practice ere long I think.

J. E. B.

Preserving Wrought Iron Tanks.

MESSRS. EDITORS—A friend is about to build a house. He wants to put a wrought iron tank, or reservoir, in the attic. Can you tell me of a composition with which the inner surface can be covered to prevent t from rusting? Are wrought iron tanks ever used in such situations? If there is a composition which will answer the purpose, will it injure the water for culinary and bathing purposes?

J. R. B.

You will find an wooden tank preferable, unless some extraordinary conditions exist. Use oak planks, painted on the outside. Iron can be partially preserved by a coating of tin or of zinc (galvanized iron) or by paint.

The Steamship Great Eastern.

The London *Artisan* for March says it is intended to launch this mammoth iron ship in June or July next, but as the best tides will be in August, it may be deferred till then. Describing the progress of the details, it remarks:—

"Since our report upon the state of the ship up to the 28th November last, the stempost, with two hawser-holes forged therein, one above the other, as before described, has been erected; and the whole of the iron work of the bows is nearly completed. The stern is now up in place above the knuckle; some castings are being made for the lower part of the stern which prevent the completion of the plating of that portion. These castings will shortly be finished, and the whole of the external iron work of the hull will be erected.

The whole of the main portions of the paddle engines are now in their respective places in the ship, and are being finally fitted together. The two pairs of boilers in connection with the paddle engines are completed, and fitted in their positions in the ship, and the steam pipes belonging to them are now being put together. The whole of the main portions of the screw engines are now on the works, and the greater part of them, such as the frames, the four cylinders, pistons, condensers, &c., are in their places in the ship. Four out of the six boilers for supplying these screw engines are now on the works in course of fitting, and will shortly be placed in the ship. The whole of the parts of both the paddle and the screw engines, and the donkey engines to the boilers, are constructed, and the whole of the machinery will be completely fitted on board in about six weeks. The screw propeller is finished, and the shafts are all forged and partly turned.

The arrangements for launching the ship have been determined upon, and the work in connection with this is rapidly progressing. Messrs. Treadwell, of Gloucester and Bristol, the contractors, have undertaken the excavations, piling, and other works necessary for the foundations of the launching ways, and are making active exertions to push on the work."

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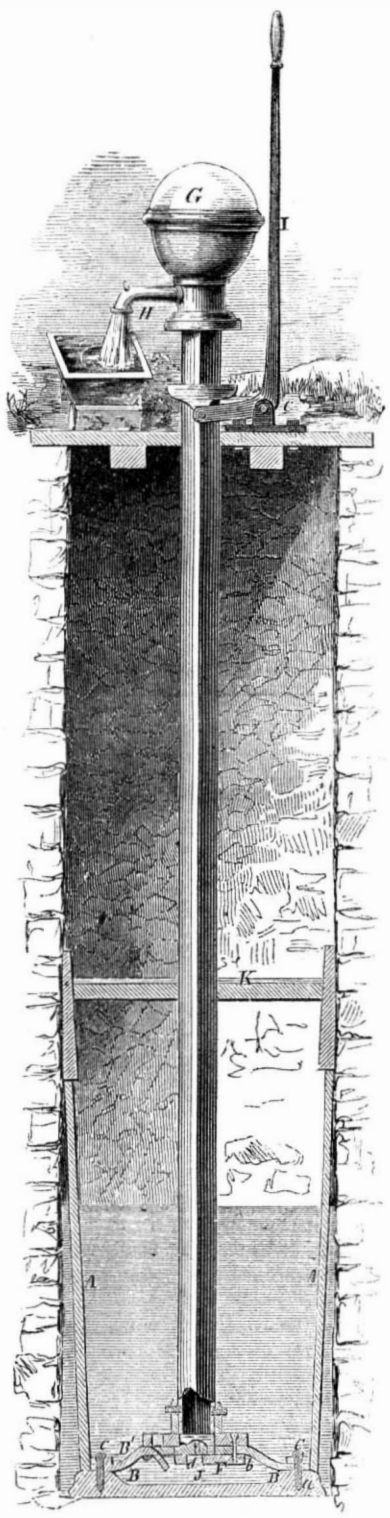
New Inventions.

Burnham's Improved Diaphragm Pump.

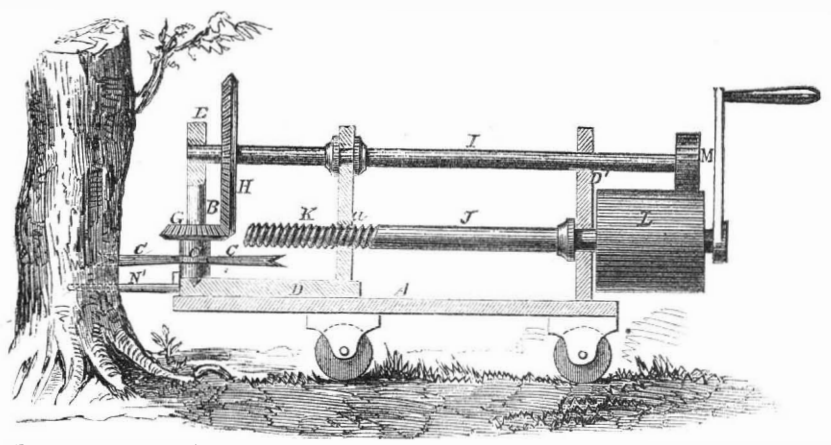
The pump illustrated by the accompanying engraving was patented by Mr. James S. Burnham, of Yorkville, this city, on the 13th of January last. It is one of the simplest and most easily constructed pumps with which we are acquainted. It is particularly well adapted to be used as a portable pump or garden engine, and for such purposes can be fitted up very lightly, employing simply a small tinned iron or sheet copper air chamber, and some strong tough leather. It is represented as serving in a well or cistern, in which application it requires a long rigid tube of some kind to connect the lever and air chamber at the top, with the flexible diaphragm at the bottom.



We may commence the description by premising that A and K are not parts of the pump, but only of a very convenient means of confining the lower part, *a*, in its place at the bottom of the well. Strips of wood, A A, resting on the edge of *a* are confined at the top by the wedges represented, which in turn are held in place by the pressure produced by K. The base piece, *a*, has a hollow, J, in its upper surface, and is covered by the flexible diaphragm, B. To the central portion of B is attached the whole upper portion, including the air chamber, G, and the spout, H, (in fact all the working parts of the pump, except the hand lever, I,) are connected directly to B, and are moved up and down at each stroke of the handle. There is a valve, as represented, which opens downward through the broad flange at the base, and another, denoted by *d*, opening upward into the perpendicular tube. With each stroke of the handle, the tube with all its attachments rises and falls. At each rise the cavity, J, is enlarged, the valve, *d*, closes, and the other valve opens to admit a supply from the well. At each fall of the pump, the water in J is compressed, which thus forces it up through *d* into G, from whence it may be discharged either through the spout, H, as represented, or through a hose and nozzle as may be desired.

There are several important advantages pertaining to this pump besides simplicity and facility of repairs. Among them may be instanced the very important fact that the valves are always wet, and sure to act with efficiency until worn out, without a possibility of trouble in starting the water. Another is its freedom from freezing, as a very small hole provided in the tube, or the ordinary leakage will prevent such a possibility, until the well or cistern itself is frozen. Requiring also no metal cylinder or rubbing action of any surfaces, it is not damaged in any way by pumping dirty or gritty water. For a garden engine, it may be secured with ease in any tub or bucket. Further information may be obtained of the inventor, who is a practical and skillful pumpmaker, by applying as above.

MACHINE FOR FELLING TREES BY HAND POWER.



Power machinery for cutting down forest trees is objectionable on account of the difficulty generally experienced in moving it about, and also, when steam power is applied, in supplying the boiler with water in sufficient quantities. In fact, this latter difficulty is a serious objection to the use in some otherwise good locations, even of portable saw mills, which do not require to be moved until all the timber on a square league or more is disposed of.

The annexed engraving represents a device invented by Thomas Durden, of Montgomery, Ala., for attempting this labor by a hand machine in a manner analogous to circular sawing. The radial cutters, C C, perform this duty, and are made in any form best adapted to cut a thin kerf, and also to allow of ready removal, so as to be kept very sharp. These cutters, mounted firmly on the shaft, C', receive motion, as represented, through the gear wheels, G, H, and M, from the broad gear wheel, L, which, in turn, receives its motion from the shaft, J, to which is attached the driving crank. N' represents one of two dogs, which are inserted in auger holes or otherwise attached to the tree to steady the machine and hold it in place. The shaft, C', is hollow, and is mounted on the upright, B, which, together with the upright, *a*, is firmly fixed in the sliding piece, D, carried on the platform, A. The crank shaft, J, is formed into a screw, with a fine pitch, and is tapped through the upright, *a*, in such manner that each revolution urges the sliding piece, D, and consequently the whole of the cutting mechanism moves forward as the work progresses, until the whole trunk of the tree is severed. The wheel is purposely made broad to allow the axial motion of the wheel, M, as the work progresses. This invention was patented Sept. 18, 1856. Any further information can be obtained by addressing the patentee at the above address.

ANTI-GARROTE COLLAR.

Fig. 1

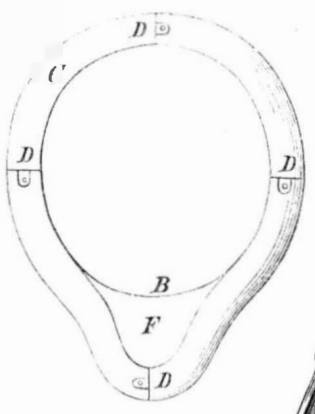


Fig. 2

Many and "sublime" have been the device to thwart the designs of that ungenteel robber the dreaded garroter, who is believed to be a stout man, with keen deep sunken eyes, low shaggy brows, and empty pocket, a short piece of rope, and one or more accomplices. Mr. Garroter steps softly up behind his victim, and chokes him with the rope, while Messrs. Accomplices abstract his portmonnaie, his watch, gold studs, gold sleeve buttons, horn-handled jack-knife, wooden pocket combs, quill tooth picks, short lead pencil, a choice recipe copied from the SCIENTIFIC AMERICAN, and all other ornaments which people worth garroting are supposed always to carry about them. *Punch* has proposed to defend the necks of the careful by stout prongs of iron projecting in all directions, making a man look like an over-grown spider, while others have suggested a small edition of a pocket-pistol, ranging backward from the neck, to be discharged by the pressure in the face of the unsuspecting marauder.

The collar here represented is the invention of Mr. C. Colne, of Philadelphia, and although it might make the wearer somewhat "stiff-necked and rebellious," would probably be as comfortable as the stiff stove-pipe hats which we so long have suffered.

A is the upper part, and A' the lower part of a thin iron collar; B is a groove all around the collar; C is the top turned over; D D D D are four joints at places where the collar can be taken apart; the parts are held together by means of hooks put on the sides. F is a knife blade put in front to cut the garroting rope when it slides in the groove, B. F is the top front part of the collar made in the shape of the chin. The inside is lined with any suitable material, and the collar may be secured either by hooks or hinges. It can be taken apart and carried in the pocket to be put on when required. The inventor has secured his invention, and any advantage of the apparatus which we have failed to describe, he will explain upon application to him.

Map Adjuster.

Mr. Wm. Stott, of Philadelphia, has invented and exhibited at the last fair of the Franklin Institute, in Philadelphia, an extremely convenient method of hanging maps against the walls of rooms. Large maps cannot be hung at any level which will make every part accessible from the floor by the ordinary means; but Mr. S. hangs them by small pulleys concealed under an ornamental cornice, and balanced by a weight behind, so that the whole may be very readily raised and lowered. When the bottom is to be examined, the map is left at its full hight, but when the middle or top is wanted, the map is drawn down at pleasure.

Information Wanted.—A Model Wanting an Owner.

We have in our possession a tin model of what appears to be a furnace. The inventor has taken a good deal of pains to letter the various parts, showing its operation, but he entirely forgot to attach his name to it, something that could have been done in a moment. For the want of this little attention on the inventor's part, we have been obliged to spend considerable time in trying, without success, to hunt up the real father of this apparently bright bantling.

If inventors would only observe two or three things, they would save themselves and us a great deal of bother and some hard cash in the bargain.

First, Never send us a model without prepaying the transit expense on it; then the receipt should be mailed to us without delay. Nearly one half of the boxes delivered at our office are apparently unpaid, and when payment is demanded we cannot refuse it unless we have the receipt of pre-payment actually in our possession. Scarcely a day passes without our being obliged to make a demand upon Express Companies for a return of money twice paid for the same service.

Second, Never allow the model to be sent to us without the name and address of the inventor attached to it. This is a sad and oft-times perplexing oversight. Take a piece of stiff paper and write the name on it, tie it to the model with a string, mark the name on with pen and ink, or scratch it with a pin—anything to relieve us from the uncertainty as to the origin of the model,

We are sometimes censured by our correspondents for neglecting their business, when the real cause of all the delay is owing to some such oversights as we have pointed out.

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Scientific American.

NEW YORK, MARCH 28, 1857.

Museums for Models, &c.

A very laudable effort is being made in several of our principal cities to establish, under various names, depositories where models, drawings, and specimens of valuable or novel inventions, may be made accessible to the public, the design being to benefit the patentees by the advertisement it affords of their wares, and to advance the interests of the public, by the instruction and entertainment such an exhibition will offer. The general idea is by no means new, as all our fairs are exhibitions of this kind, but the novelty consists in the endeavor to make such an institution perpetual. There are several difficulties in the way of the success of such an enterprise, though none of them we think absolutely insurmountable. One of these difficulties—the most serious probably in any such concern which may be started under circumstances which compel it to be self-supporting—is the want of sufficient patronage. Either the public or the inventors, or both, will be so slow in appreciating the advantages afforded, and in being made to believe that the concern is really well conducted; that the financial affairs of the exhibition will become embarrassed, and the proprietors bankrupt some years before the museum is properly started. We may be mistaken, and would speak with modesty on the subject; but really do not believe that such an establishment can burst forth at once upon an astonished world. Be that as it may, we shall endeavor to promote the success of all by diffusing intelligence of their whereabouts and success, with a view to the interest alike of their projectors, the inventors, and the public.

It may here be regretted that more than one such enterprise should be started at once. Strictly speaking, we know but two in the whole country—one the "Hall of Patents" in this city, comprising the whole third and fourth floors of a very large single building at Nos. 594 and 596 Broadway, and the other the "Hall of Arts," Boston, located at the corner of Essex and Lincoln streets. Both are private enterprises, and are started or proposed to be, under the charge of highly respectable parties. The manager of the first named is Mr. R. D. Goodwin, a successful real estate agent, and a prominent member of the American Institute; the latter is conducted by Elizur Wright, Esq., successively the active and talented editor of several popular newspapers, one of the more noted of which was the *Chronotype*. We say "propose to be," for we are not certain as either has yet opened, although advertised to do so many months since. The Boston enterprise was at last accounts delayed to allow time for plastering and finishing the halls, which were at first intended to be used rough. The New York rooms were apparently finished, but empty, at Christmas; they contained one well filled small glass case, and a broken "real estate" sign, at the period of our last visit in February, and at the very latest advices, March 12, had received goods for exhibition from only two houses, both New York establishments, and was advertised to open on the 16th. This last report may be incorrect, but we are endeavoring to do exact justice to all the parties directly or indirectly interested.

The financial support of such an enterprise being a matter of the most difficulty, it may here be mentioned that the Boston hall proposes to charge a moderate admittance fee to visitors, while that in our city is to be absolutely free. Both, we think, charge a small sum to exhibitors, according to the space occupied; and both allow, in fact desire, the presence of exhibitors, or their agents, to explain, and, if they choose, sell their goods, patent rights, &c.

While thus noticing these, one or both of which we hope may yet prove a highly useful means of diffusing information, it may be unjust not also to notice the various humbler exhibitions of similar articles which have been a long time in existence. The Mechanics' Institute, while at the corner of the Bowery and Division streets, advertised for such articles to be stored and shown free of charge, and received quite a number, but we think have not attempted it since their removal up town. The American Institute continue to show at their rooms, 351 Broadway, any models or full sized machines which are offered, and we may add that they are, we believe, always well cared for. We do not know the terms on which such articles are received, nor how long they are allowed to remain, should think generally not long; but, in addition to the advantages of ordinary exhibition to a few occasional visitors, the inventor or a friend can generally have the privilege of explaining them to the Mechanics' Club at its regular sessions there. The Crystal Palace, yet open, offers plenty of vacant room and attracts some visitors; the annual fairs—State, county and charitable—are well known and generally well appreciated, and there are dozens yes, scores of energetic agents and dealers who make their stores and offices quite interesting museums. Mr. Copeland's office is always a curious museum of inventions relating to marine steam engineering. Mr. Haswell's little less so. Messrs. Bridges & Brother, Taulman & Lowe, Mr. Bowles, and several others, exhibit and explain with great courtesy the several improvements in railroad or manufacturers' articles. Mr. Schenck, Mr. Hills, Andrews & Jessup, and the agent of the Essex Company show most of the modern improvements in tools. Mr. Prentice, ditto of draughting instruments, and Mr. Pike of philosophical toys. All these latter are simply warehouses where the goods are for sale, a state of things to which any more pretentious exhibition must of necessity very rapidly tend. The benefits of exhibition, without such immediate results, would be too intangible for our fast age; but although conducted with a view to direct sales of rights, goods or machines, it is possible to establish large exhibitions much more instructive and beneficial than the mere agencies and stores. The direct collision of rival inventors and inventions on the same floor, although arousing bad blood at times, serves to elicit truth and prevent stagnation, and unpromising as our report now appears, we hope to see such a perpetual fair in successful operation before many years.

The Burning of Gunpowder.

There are some operations so slow as to challenge the highest effort of the imagination. Such are some of the changes revealed to us by geology. There are others so extremely rapid that their division into successive steps becomes still more difficult. In this last class may be included the successive ignition of each grain in a charge of gunpowder. It is in one of those subjects difficult to reduce to experiment—a fact which, were it not sufficiently obvious of itself, could be readily proved from the diverse opinions expressed by *savans* who have investigated the questions connected therewith.

Professor Treadwell, of Cambridge, has within a few months published a paper on the construction of large cannon, in which he concludes that it is possible and perfectly practicable, with our present means and materials, to construct large cannon which will throw balls to a very greatly increased distance. He proposes to do this by shrinking hoops upon the guns, a form of applying the material which would certainly increase the effect of the exterior layers of metal, although it would tend to increase the crush, and contribute to the disintegration of the interior particles when the explosion of the charge occurs.

But we recurred to that paper mainly for its graphic description of the process of firing, which is as follows:—

"Count Rumford has proved that the burning of the grains is slow, or that a sensible time is required with each grain before it is wholly converted into the gaseous state; and various experiments made in England and in Prussia have shown that there is no sensible difference produced in the velocity of the shot by communicating the fire to the center rather than to one end of the charge, which ought evidently to take place if the fire is communicated from one grain to another in succession, as this communication, being in both directions when proceeding from the middle, would require but half the time that is required when proceeding from one end, and ought to produce a sensible increase in the velocity of the shot.

I think therefore that these two facts warrant the following inference as to the course of the action during the production of the force. When the fire reaches the charge from the touch-hole, the nearest grains become kindled, the hot fluid evolved is thrown further into the charge, and the burning succeeds successively until the pressure becomes so great as to condense the air contained between the grains sufficiently to produce the heat required for firing those grains, which are then consumed more or less rapidly, as they are fine or coarse. We have, then, first the burning in succession of a small part of the charge; then the immensely rapid, though not instantaneous, kindling of every grain composing it; and then the consumption of those grains, which is not accomplished without time. It is a task for the conception to grasp these events, following one another in distinct succession, each having its beginning, middle, and end, and all being comprised in the period of 1-200th of a second (gun 4 feet long, *formula* $t = 2s + v$). When we have mastered the imagination of these, we may go further and combine with them the connected and contemporaneous action of the ball, which passes from rest to motion, and through every gradation of velocity up to 1,600 feet a second, and leaves the gun as our historical period of 1-200th of a second expires."

We may add that the formula does not apply exactly, and the time during which the powder burns profitably is, consequently, less even than the Professor has estimated. The formula would apply if the powder acted with equal force on the ball from its commencement of motion until it left the muzzle; but this is not the fact. The powder, or rather the expanding gases produced by its combustion, acts with most force at the beginning of the motion, and gradually dies away. We will present some facts relating to the varying pressure on the interior of a gun in our next issue.

The Manufacture of Iron.

The name of Henry Cort, a native of Great Britain, should be forever kept prominent as among those of inventors to whom the world owes most. Cort cheapened wrought iron, a step nearly or quite as important as the previous invention, by Lord Dudley, which had cheapened the production of pig. Cort introduced as great a change at that period in the wrought iron manufacture as the processes agitated within the past year could do now, even if perfectly successful. He invented the puddling process almost exactly as now conducted, and although Mr. Joseph Hall, of Staffordshire, the author of a book on the subject, recently published in London, claims for himself the invention of the "principle of boiling iron," Mr. Cort would appear, referring to his original English patent, dated in 1784, to have understood the fact that the metal would boil, and actually to have boiled it, although he perhaps was as blind as we are, (and also every one of whom we have tried to take lessons) with regard to its precise nature and effects. The following from the original patent of Mr. Cort will be interesting to iron makers, as showing how far puddling was set forth at that day, and to others as a brief and clear explanation of the process by which this all-important metal is changed from the stiff and crystalline carbonate, which can only be worked by melting and casting, into the fibrous condition in which it is worked on the anvil:—

"I make use of a reverberatory or air furnace or furnaces, of dimensions suited to the quantity of work required to be done, the bottoms of which are laid hollow, or dished out as to contain the metal when in a fluid state. My furnace, for the first part of the process, being got up to a proper degree of heat by raw pit-coal or other fuel, the fluid metal is conveyed into the air furnace by means of ladles or otherwise. When this air furnace is charged with sow and pig metal, or any other sort of cast iron, the door or doors of the furnace should be closed till the metal is sufficiently fused; and when the workman discovers (through a hole which he opens occasionaly) that the heat of the furnace has made a sufficient impression upon the metal, he opens a small aperture or apertures, which I find is convenient to have provided in the bottom of the doors (but which is or are closely shut, as well as the doors, at the first charge of the furnace with cold cast metal); and then the whole is worked and moved about through these apertures by means of iron bars and other instruments fitly shaped, and that operation is continued in such manner as may be requisite during the remainder of the process. After the metal has been some time in a dissolved state, an *ebullition*, *effervescence*, or such like intestine motion takes place, during the continuance of which a blueish flame or vapor is emitted; and during the remainder of the process the operation is continued (as occasion may require) of raking, separating, stirring, and spreading the whole about in the furnace till it loses its fusibility, and is flourished or brought into nature. And the whole of the above part of my method and process of preparing, manufacturing, and working of iron is substituted, instead of the use of the finery, and is my invention, and was never before used or put in practice by any other person or persons."

Sending Money by Mail.

We alluded, in our last number, to the British system of money orders as infinitely superior to our abortive practice of registering letters. An English gentleman in this city, Mr. George Edwards, is earnestly endeavoring to introduce the money order system in this country, and in precisely the same manner in which it was first made successful in Great Britain, by the agency of a private company. The money order system was first established in England as a private enterprise, and subsequently purchased by the government. The system, whether public or private, would certainly very much facilitate the payment of subscriptions for newspapers, small transactions in books, &c., now quite extensively conducted. The system is briefly this:—A party wishing to send five dollars to a friend or business connection, goes to the nearest Post Office, deposits the money, which is placed by the Postmaster to the credit of the Government, and received therefor a money order which he encloses in his letter. The recipient presents this document at any Post Office he pleases, and receives therefor the amount of its face, which is charged by the Postmaster, in turn, to the Government. The price of orders for twenty-five dollars is six cents, and for between that amount and fifty dollars, twelve cents. These are the English prices. We are not aware that any tariff of rates has been determined on for the American Company, if the enterprise is ever made to succeed, as we sincerely hope it will be.

Inventions Wanted.—Coal Burning.

It may not be impossible—although it now seems so from the nature of the material—to regulate a coal fire as quickly and easily as when wood is employed for fuel. This is one of the great difficulties in the employment of coal for fuel in a great variety of situations, but especially on locomotives. The power required on a railroad is exceedingly variable. At times the train is running down a grade of such inclination that absolutely no power is required to impel it, and immediately afterwards, perhaps, it is exerting all its force to move the train slowly *up* a similar inclination. A wood fire is easily controlled, but the steam-generating power of coal-burning locomotives cannot well be. Shutting the draft does not immediately lower the temperature of a heated mass of anthracite and, as a consequence, water is made into steam and blown off to waste in many instances; while, on the other hand, a suddenly increased current of cold air blown through the grates into a coal fire does not seem to very rapidly raise it. Can this difficulty be successfully overcome?

Steel made by mingling manganese with iron has been lately affirmed to be better than carbon steel.

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The National Hotel Sickness.

"A great many versions of the origin of the sickness which of late has affected the guests at the National Hotel, in Washington, have been given, but none that we know of which accord with the opinions of those who have been upon the spot and taken the pains to inquire into the facts. The rat-poisoning is something which occurred two or three years ago, and the story has probably been re-hashed now because the stench or odor about some parts of the house seems to resemble that then observed.

The proprietors of the house, like the few boarders who adhere to it through evil as well as through good report, are utterly ignorant of the cause of the disease, while they are not, and cannot be blind to the fact of its existence. Like others, they can only conjecture, while they hope it may speedily pass away. Their continued ignorance of the cause does not speak well, however, for their energy. They have satisfied themselves with proving that it does not come either from the food or the water, and there they stop, having in despair closed the house.

The fact that the poison is in the air is proven not less by the investigations into food and water, than by the unpleasant odor which pervades the lower stories, and the existence of water-closets in various parts of these stories, while there is neither odor nor water-closets in the upper stories, points to them and the sewerage pipes as the probable causes of the difficulty.

Learning wisdom by experience, President Buchanan, on his late visit to Washington, previous to his inauguration, took up his lodgings, privately, at the residence of Mr. Corcoran, the banker, while at the same time he retained his rooms at the National, occupying them only during the day, and venturing to eat nothing save a cracker by way of lunch. Visitors at the National can be "spotted" in many parts of the country, simply by the disease, which, if it did not attack them while in Washington, followed them to their homes.

In character the disorder closely resembles the lighter forms of cholera."—[N. Y. Sun.

"Since the publication of the resolutions requiring an investigation and report by the Mayor and Board of Health into the causes of the disease which has been prevailing at the National Hotel, it has been suggested that a cause of the sickness, and perhaps a principal one, is to be found in the tapping of the sewer at the corner of Sixth street and Pennsylvania avenue. The noxious gases, instead of escaping into the streets, as heretofore, have found vent in the hotel, manifesting themselves at least by the odor which has at times pervaded the house."—[National Intel.

[It has never yet been definitely determined what gases do or do not produce disease of any particular kind, and this seems to be a very favorable opportunity for chemists and medical men to investigate the question. The National is the crack hotel of the capital of our country; and is untenable from some unknown cause. We are surprised at the apathy of the *savans*, who should delight in an opportunity to investigate it. Such a chance does not occur often.

Smooth Surface on Castings.

A correspondent inquires how to face his moulds to procure smooth heavy castings. It is easy to produce smooth castings when the pattern is thin, and the mass of metal consequently small, so that the heat is very rapidly reduced; but with large castings where the heat is intense and long continued, his facing, we presume, is consumed, and the surface of the metal left rough.

Moulding sand should be very nicely proportioned, to procure just sufficient cohesion and yet be sufficiently porous to allow the escape of air. Any facing also which is made air tight is liable to generate blow holes and other faults in the casting, however much it may conduce toward a smooth surface. We would like to receive and publish descriptions of the methods found most available in overcoming the difficulties, and particularly the means of producing the exceedingly smooth and fine images termed Berlin castings. We feel certain that there is much valuable information afloat on this subject which has never been published.

We would here remark on the expediency, whenever practicable, of printing the facing—that is, when the pattern has been carefully removed, and the facing applied, put the pattern back into its place, and strike it with sufficient force on all parts, to smooth and solidify the added material. There are many patterns where this method is impracticable; but wherever it can be employed, it will be found to add materially to the smoothness of the product.

Church Clocks.

It has been contended by some that our church clocks generally are very deficient in regard to accuracy, and the illuminated clock on the City Hall, in this city, has been sneered at habitually as one on which no reliance at all could be placed. A correspondent, however, who is in a position to be much better posted on the subject, assures us that the time of our City Hall clock is always correct, that the regulator has not been altered for over two years, and that it is nine months since a hand upon its face has been touched. Considering the jar consequent upon ringing the enormous fire-bell on the same structure we consider the clock keeps wonderfully accurate time. We have a clock in our office from the same manufactory—John Sherry's, of Sag Harbor, N. Y.,—of which we might say equally good things, but modesty forbids; and we should not have even alluded to the City Hall clock, had not our attention been called to it by a reliable correspondent.

There are circumstances, such as the effect of wind on the hands, etc., which make it difficult to give to a church clock as much regularity as it is possible to attain in smaller constructions working wholly in the interior of a building.

St. John's Chapel, in this city, has, or had at the period of our last visit to its spire, some few years since, a very ingenious and obvious device for insuring a tolerable accuracy, or rather for obtaining a very frequent correction of its errors, by self-acting mechanism. The clock proper, strongly and roughly constructed in the usual manner, is set to run considerably too fast, so that it will be sure to gain several seconds in the course of every hour or half hour, at the termination of which period the pendulum is caught at one end of its motion and held fast. Another clock of the most exquisite adjustment possible, like the clocks in jewellers' establishments, is mounted independently inside, and so connected that it disconnects the stop at the instant the true period expires, so that the clock seen by the public is continually gaining time until the end of each hour or half hour, when it stops dead, and takes a fresh start. It is, of course, not necessary to let the coarse clock-work run much too fast, but only so much that it may be sure in its variations never once to run too slow.

The Magic Corn Husker.

Mr. William Lewis, of our village, has invented a machine which promises to be one of the most useful of the day. It is fitly called the "Magic Corn Husker," from the quickness and certainty with which it performs its work. There is no mistake about it, and an examination of the machine will satisfy any one that it is truly a valuable invention. It will husk wet corn as well as dry, and the only limit to its rapid performance is the ability to supply it with material. It is cheap, simple, worked by hand, and will come within the reach of every farmer. Mr. Lewis received his Letters Patent within less than one month from the time of his application. We understand that the editor of the SCIENTIFIC AMERICAN acted as the agent of Mr. Lewis, and his promptness and skill in all matters pertaining to the patent department, insures a great advantage to those applying for patents through the same agency.—*Seneca Falls Reveille.*

[We are preparing an engraving of the above invention, which will shortly be published.—EDS.]

Mud Houses.

Has it been firmly and finally settled that mortar and small stone (concrete or Beton,) cannot be made to succeed in practice, as the only material in the sides of dwellings? Instructions for its use have been extensively circulated, and a book on the subject has been published, which met with a liberal sale; but so far as our observation goes—which we confess is extremely limited—the walls have not been sufficiently successful to warrant further attempts. The difficulty has arisen from the very frequent occurrence of rain and wet weather before the material had sufficiently hardened. Can our readers inform us whether this is really a fatal objection and, if so, how it can be obviated?

Chinese Plants.

Potatoes and sugar cane from China may prove great traps for agriculturists, but we will endeavor, at this season, when every one is, or soon will be, preparing to lay out their garden or farm work, to give the latest intelligence of importance which we consider entitled to credit relating thereto. The potato is, very possibly, worthless in quality, but the syrup of the cane, we know from a trial of a sample, is very respectable sweetening, and the stories told of the productiveness of both are most extraordinary. As some contradictory reports have been published with regard to the modes of cultivation, we cut the following on the potato question from the Putnam (Iowa) *Banner*:—

"'The tubers,' five in number, were ready to transplant in April. By the last of May the vines were one or two feet long; but, unfortunately, the frost on the 1st of June nipped them to the ground, and put them back three or four weeks. New vines came up, and grew tolerably well through the remainder of the season, but, no doubt, considerably stunted by the extremely dry weather.

As soon as the vines became two or three feet long, I cut them off, and divided them into as many segments as there were leaves or pairs of leaves. These were placed in boxes of earth, and watered at least once each day, until frosts came in the Fall. Each leaf treated in this way produced a little tuber, such as I planted in the Spring. In this manner I have succeeded in obtaining some four or five hundred tubers.

I dug one hill, and found two potatoes; the smaller one was near two feet long and one inch thick, and the other thirty inches in diameter. The yam looks delicious; I have not tasted it yet."

Our impression, formed from the published accounts alone, without any practical experience, is that the potato is very poor feed, and, according to the above most favorable report, quite troublesome in its cultivation.

With regard to the *Sorgho Sucre*, or Chinese Sugar Cane, the New Orleans papers, published in the midst of the only sugar section of the United States, contains facts that look favorable to its introduction. Thomas Affleck, Esq., of Mississippi, writes that he has closely studied this plant, and watched the results of the various experiments made, from its first introduction into France to this time, and thinks it possible that it may supplant the sugar cane, but thinks the sugar-growing States cannot lose, even if that be the result, as it will yield more sugar there than further north, beside attaining a vastly larger growth. The South will have an additional advantage in its supply of machinery perfectly adapted to the purpose, and its thorough knowledge of sugar-making.

Mr. George W. Kendall of the New Orleans *Picayune*, writes a letter to that paper on the same subject from his plantation near New Braunfels, Texas. He has made partial experiments with its culture, and says that of its properties for the production of sugar, he can as yet say nothing; he only knows that it tastes like the common sugar cane, and is full of juice about the time the first heads ripen. He adds that as a green fodder it beats everything that grows; horses, sheep, and hogs are inordinately fond of it, and so full are the stalks of saccharine matter that they must be both nutritious and nourishing. Mr. Kendall says it stands a drought better than anything he has, and does not seem to require rain after it is once up.

Prof. Bacon, of Boston, said in a lecture at the Medical College, that the saccharum of the Chinese sugar cane is not cane sugar, but what is well known as grape sugar or glucose—the same kind of sweet substance that is obtained by boiling starch in diluted sulphuric acid.

We presume most of our readers are aware that the sugars from beets, maple trees, corn stalks, and sugar cane appears to be alike, and naturally inclined to granulate in solid hard crystal, while grape sugar is more inclined to remain in a soft mass, without granulating, and is much weaker in saccharum, though rich as a food.

Grape sugar is abundant in fruit of all kinds, but does not crystalize, except imperfectly. The white sugar in raisins, however, is of this kind, as is also that portion of honey which solidifies. The chemical constitution and the practical values of the two sugars are very different. Two ounces of cane sugar, according to the text books, are equal in sweetening power to five ounces of grape sugar.

More about the Sex of Bees.

The theory by which the distinction between worker and drone bees is made to devolve on the size of the cell, is thus set forth in a recent article by J. P. Mahan, a distinguished apiarian of Philadelphia. It will be found extremely novel, we think, to most of our readers, so far as relates to the existence and effects of spermatic fluid injected by the queen. Certain of the lower orders of creation—earth worms or angle worms for example, are supposed to combine male and female in the same individual, but this seems to make the bees analogous neither to them nor to any other species. He says the cells in which the workers are hatched are comparatively small, five of them occupy about one inch, while the drone cells are about four to the inch. In the former case, when the queen deposits an egg, her body being larger than the cell, a slight compression takes place, and as the egg passes the mouth of the spermathico, a minute portion of the fertilizing fluid is ejected upon it, causing it to produce a worker, unless we step in and change its destination, by converting it into a queen. On the contrary, when the egg is deposited in the drone cell, which is larger than the body of the queen, no compression takes place; the spermathico remains closed, and the egg invariably produces a drone or male, the lowest in development of the denizens of the hive. These facts prove conclusively, if we supply the queen with worker cells, her progeny will invariably be workers. On the contrary, if she has only drone combs, nothing but males will result.

Self-Acting Regulators.

The heat developed by a fire—by a wood fire especially—can be very readily and completely controlled by opening and closing a valve so as to vary the supply of air. There are several modes of making this movement automatic. A form of air-tight stove—quite popular in the Western States a few years since, and for aught we know still the favorite—has a strip of metal in the front of the structure which, by its varying expansion with fluctuations of the temperature, so far controls a flap valve which covers the draught orifice as to ensure quite a uniform temperature. The heat in Berdan's great bakery is controlled by similar means. A long strip of thin brass extends vertically the whole depth of the oven. A great change of dimension with heat make its movements very sensitive in giving motion to a valve, which is hung like a damper in the draught orifice. There are many situations where this, or some similar device, might be constructed very cheaply, and would probably prove of great service.

Baling Cotton.

The recent great fire in Mobile, in which several thousands of bales of cotton were destroyed, has caused an extensive discussion in the Southern papers on the expediency of baling cotton with wire. The principal advantage is, that wire will not burn like rope, and, bursting, scatter the cotton to the flames and the wind, causing the destruction of every other bale within its reach. Cotton bound with wire could scarcely be made to blaze, and if combustion be carried on at all it must be in a smouldering condition.

The growing of sugar has been commenced in Liberia on the coast of Africa.

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J. V., of C. W.—"Wooden tan vats decay very rapidly. I intend to make some of brick or stone and water cement. What effect will the tannin have on the same or vice versa?" It has not been tested to our knowledge. Give us the results.

A. H. L., of Wis.—The purchase of a machine from the patentee, or the owner of a patent, does not necessarily include the right to use it. There should be a specific bargain and a written guaranty made in regard to the right. The patentee can restrict the use of the machine to any locality he may desire; but if he sells the machine and the right to use it, without limitation, the purchaser could use it anywhere within the particular territory owned by the assignee or owner of the patent at the time of the transfer. If the patent is extended, the extension does not inure to the benefit of purchaser under the original grant The extension is granted for the exclusive benefit of the original inventor. It would not be patentable to apply ambrotypes as you propose, viz., to the bottom of glass paper holders.

B. McK., of Va.—The drummond light is produced by burning oxygen and hydrogen on a piece of quicklime. The lime does not endure well unless it is very free from magnesia, and even then cracks and laminates in a few hours. Write to Robert Grant, of this city, who has managed most of the exhibitions of this light in this country. See reply to W. H., this week.

G. B. A., of La.—Messrs. Hoard & Sons, of Watertown, Y., make good portable engines.

James M. Thomas, of Wyomoning, Ill., wishes to procure the address of the correspondent who furnished the article on running circular saws on page 188, No. 24, of the S cientific American.

H. M., of Conn.—A frame house with its sides and flooring filled in with charcoal dust is no more liable to be struck by lightning than any other frame house not provided with a conductor.

J. A. Fisk, of Springfield, Ill., wishes to purchase the right for southern Illinois of a good wheat drill. Patentees of machines that have been proved will please to open correspondence with Mr. Fisk.

W. C. A., of S. C.—The only way for you to get paid for your information in regard to running saws will be to print it, and sell the circular. We should not wish to engage in their sale.

S. B. E., of Pa.—The method of heating buildings most congenial to health is generally considered to be by warm water. For information on this point address A. W. Rand, 83 North Sixth st., Phila. See engravings of his furnace on page 401, Vol. 11, Scientific American. We cannot tell you the cost of heating colleges and seminaries by hot air furnaces or water furnaces, but the cheapest method, we believe, is by the use of hot air. Henry Ruttan's combined system of heating and ventilation is the most esteemed by us. The foul or spent air is expelled at the floor and not at the roof or side walls, as by common methods of ventilation. Mr. Ruttan is sheriff of Coburg, C. W., where you can address him.

W. M. F., of Va.—We have no doubt but that your family is very prolific in science, but we have not time to read long rambling accounts of what each member is doing, or proposes to do. If you have any inventions to submit, or actual progress of any kind to report, we will examine your letters with care.

C. K. K., of Pa—We hope you will send us some brief practical articles on agricultural subjects. So far as regards implements for the use of agriculturists, we notice already the most important that come out from time to time. We prefer to prepare such notices ourselves.

G. F. W., of Ga.—From the character of the gentlemen who have furnished Mr. Pease with testimonials of the good qualities of his oil, in addition to our own experience, we are satisfied that he sells a very superior article as lubricator or illuminator. Address F. S. Pease, Buffalo, N. Y., for one of his circulars.

H. P., of Mass.—Ventriloquism means speaking from the chest. This power may be attained by practice, but it is generally a natural gift in those who pursue the profession. Sound is increased by the vibration of the atmosphere. Windows which have been broken by the firing of cannon, or by explosions occurring in the neighborhood, have been noticed to fall outwards, from which some have inferred that the cause of their breaking is the rushing of the air to fill up a vacuum outside of the building. Prof. Treadwell's paper on the manufacture of large cannon you can find in the Annual of Scientific Discovery for 1857.

C. C., of Ind.—A small open pipe running up through the center of a spout of a building, for the purpose of thawing out the spout by steam or hot water, is a new and a good plan for effecting the object. Tar has been employed for preventing incrustations in boilers. Ammonia will prevent lime forming scale in boilers, but it acts upon the metal, and is not safe to be used.

Money received at the Scientific American Office on account of Patent Office business for the week ending Saturday, March 21, 1857:—

J. W., of Ky., $55; P. E. H., of N. Y., $30; G. & B., of N. Y., $100; M. J., of Pa., $20; T. A. D., of Cal., $20; A. C. R., of Conn., $30; C. T. P., of Mass., $30; T. L., of Pa. $20; P. K., of R. I., $60: D. P. & Co., of N. Y., $250; C. A. W., of Conn., $110; A. W., of Pa., $30; J. B., of Tex., $30; W. Y. G., of Ky., $55; F. G. H., of N. Y., $30; F. O. H., of N. Y., $30; F. O., of R. I., $25; W. Mt. S., of N. Y., $100; A. C., of N. Y., $30; J. F. B., of Mass., $25; H. R. W., of ——, $30; A. P., of O., $20, J. G., of Ga., $30; E. T. M., of Mass., $30; B. F., of Mass., $40; T. J. L., of Pa., $25; R. P., of Conn., $57; B. & B., of Conn., $10; M. T. J, of O., $25; A. B. J. F., of Ill., $30; J. L. F., of Ill., $30; J. W. T., of Pa., $30; I. A. S., of O., $25; S. B., of La., $50; S. O. C., of R. I., $30; W. & C., of O, $25; W. W., of Wis., $25; H. S., of N. Y., $30; E. M., of N. Y., $25; A. H., of N. Y., $12.

Specifications and drawings belonging to parties with the following initials have been forwarded to the Patent Office during the week ending Saturday, March 21, 1857:

T. J. L., of Pa.; C. S. M., of N. Y.; S. H., of Pa.; H. S., of N. Y.; F. O., of R. I.; J. G. A., of N. Y.; W. M. M., of Ill.; A. W., of Pa.; M. J., of Pa.; J. F. B., of Mass.; W. H. S., of R. I.; W. W., of Wis.; T. L., of Pa.; E. M., of N. Y.; M. T. J., of O.; W. & C., of O.; I. A. S., of O.; A. H., of N. Y.

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Private consultations respecting the patentability of inventions are held free of charge, with inventors, at our office, from 9 A. M., until 4 P. M. Parties residing at a distance are informed that it is generally unnecessary for them to incur the expense of attending in person, as all the steps necessary to secure a patent can be arranged by letter. A rough sketch and description of the improvement should be first forwarded, which we will examine and give an opinion as to patentability, without charge. Models and fees can be sent with safety from any part of the country by express. In this respect New York is more accessible than any other city in our country.

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In addition to the advantages which the long experience and great success of our firm in obtaining patents present to inventors, they are informed that all inventions patented through our establishment, are noticed, *at the proper time*, in the SCIENTIFIC AMERICAN. This paper is read by not less than 100,000 persons every week, and enjoys a very wide spread and substantial influence.

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FRANCIS H. SMITH,
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F. H. SMITH—Dear Sir: I have delayed in giving you my opinion of your Brick Machine until this time, because I desired to be just as well to those who might be influenced by my opinion as to yourself. After surveying my operations for the past summer I can confidently say your representations have been fully realized. I have frequently made twenty-two thousand bricks per day, though we took twenty thousand as a task, and accomplished it invariably when we had no interruption. I have been engaged in the manufacture of Bricks for many years, have used and examined many machines, but for simplicity, durability, and efficiency have seen no machine for using tempered clay to equal yours. It has been worked through the whole season without an accident to delay us one hour, or to cost one dollar, except the breaking of perhaps five or six molds. It is a perfect machine of its kind. The bricks, when well burned, are harder than New York hand-made bricks, with which I tried them, and the salmon are of better quality than any I ever saw before.

H. J. B. CLARK.
1* Newbern, N. C., Sept. 24th, 1856.

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THE NEW YORK HALL OF ARTS is now open to receive contributions from all parts of the country for a permanent Free Exhibition. Inventors and others will send at once for a Circular, as it gives advantages never before obtained. Address I. S. CLOUGH, 594 Broadway, New York. R. D. GOODWIN, President. 29 3

FULL DIRECTIONS for making and using Richard's composition for plating bright cast iron, by dipping the pieces in melted tin, will be sent to any person inclosing $1 in money or postage stamps to IRA A. RICHARDS, Spencer, Mass. 29 2*

ENGINEER—A situation wanted by a young man of several years' experience, to run a stationary engine, either in the city or country Can produce the best of references from Messrs. R. Hoe & Co., and other gentlemen of high business standing in this city. A note addressed to G. H. MOORE, No. 18 Watts st., N. Y., will meet immediate attention. 1*

PATENT ARTIFICIAL STONE—Patent bearing date March 10th, 1857. Frost, fire, and weather proof; 50 per cent. cheaper than any other production; no paint, oil, nor coloring required; worked with great rapidity. Information regarding sale or licenses for counties, cities, or States given by the patentee. Address, THO'S. HODGSON, No. 7 Beach Place, Brooklyn, N. Y. 1*

WANTED—Invention. Any one having a light and practical invention, wishing one experienced to financier, and work out the same, can address, stating nature of the invention, B. E. F., Box 2238, Post Office. 29 2*

TO PROGRESSIVE MECHANICS, Architects, Builders, &c.—Instructions for marking out a scroll of any size and proportions, as quick as a circle can be described with compasses, and geometrically correct, will be sent by the inventor upon the receipt of $1. Address, A. BELCHAMBERS, Ripley, Ohio. 29 2*

A NEW and improved recipe for making superior honey, equal to that made by bees, and at less than half the cost, and eight other new and improved recipes of rare value, for $1. E. A. WATSON, Cleveland, O. 1*

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SAW GUMMERS—G. A. PRESCOTT, of Sandy Hill, N. Y., continues to manufacture Saw Gummers, Saw Tools, &c., calculated for Gang, Muley, and large Circular Saws. For sale by Thompson Brothers, Buffalo, N. Y., J. B. McGenniss, and W. F. Dominck, Chicago Ill.; Caswell & Gaylord, and Nazro, Milwaukie, Wis.; S. S. Sherwood, Fondulac, Wis.; Allen & Billings, Oshkosh, Wis.; Schenck Machinery Depot, New York. 27 3*

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SECOND-HAND MACHINERY FOR SALE—One Planer, will plane 10 ft. long, 3 ft. wide, 3 ft. high, cost $800; price $550, cash. One Planer, will plane 5 ft. long, 20 inches wide, 16 inches high. cost $350; price, $250, cash. One Engine Lathe, will turn 13 feet long, swing 20 inches, weight rest, and chain feed, cost $350; price $225, cash. One Engine Lathe, will turn 8 feet long, swing 20 inches, weight rest, and chain feed, cost $290; price $130, cash. All of the above are in perfect order. GEO. S. LINCOLN & CO., Hartford, Ct. 23tf

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NEW MACHINERY FOR SALE—On hand, No. 0 Lathes, 8 ft. bed, swing 16 inches, weight rest, price $250; No. 1, 10 ft bed, swing 20 inches, gib'd rest, price $315; No. 2, 14 ft. bed, swing 30 inches, gib'd rest, price $525. All of the above are Screw Cutting Engines with rack and screw feed combined. Milling Machines for gun work, complete, for $320, cash. All of the above are warranted first-class work. GEO. S. LINCOLN & CO., Hartford, Ct. 23tf

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23tf C. D. PAGE, Rochester, N. Y.

WOODWORTH'S PATENT PLANING MAchines of every kind and all prices. A large assortment on hand; and I am prepared to construct any machine to order from ten days to two weeks, and guarantee each machine to be perfect in its construction, and give purchasers entire satisfaction. The patent has expired, and will not be renewed. I make this business exclusive, manufacturing nothing but the Woodworth Machines, and for that reason can make a better article for less money; and with my fifteen years experience I fully guarantee each machine to come up to what I am willing to recommend, that is, that each machine shall be more than equal to any other manufactured for the same price. JOHN H. LESTER, 57 Pearl st., Brooklyn, N. Y., three blocks above Fulton Ferry. 27 tf

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N. B.—Reliable orders filled for any part of the United States and Europe. 27 tf

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NEW HAVEN MFG. CO.—Machinists' Tools, Iron Planers, Engine and Hand Lathes, Drills, Bolt Cutters, Gear Cutters Chucks &c., on hand and finishing. These Tools are of superior quality, and are for sale low for cash or approved paper. For cuts giving full description and prices, address, "New Haven Manufacturing Co., New Haven, Conn. 27 tf

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HARRISON'S 30 INCH GRAIN MILLS—Latest Patent.—A supply constantly on hand. Price $200. Address New Haven Manufacturing Co., New Haven, Conn. 27 tf

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BOILER INCRUSTATIONS PREVENTED—A simple and cheap condenser manufactured by Wm. Burdon, 102 Front st., Brooklyn, will take every particles of lime or salt out of the water, rendering it as pure as Croton, before entering the boiler. Persons in want of such machines will please state what the bore and stroke of the engines are, and what kind of water is to be used. 27 tf

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Science and Art.

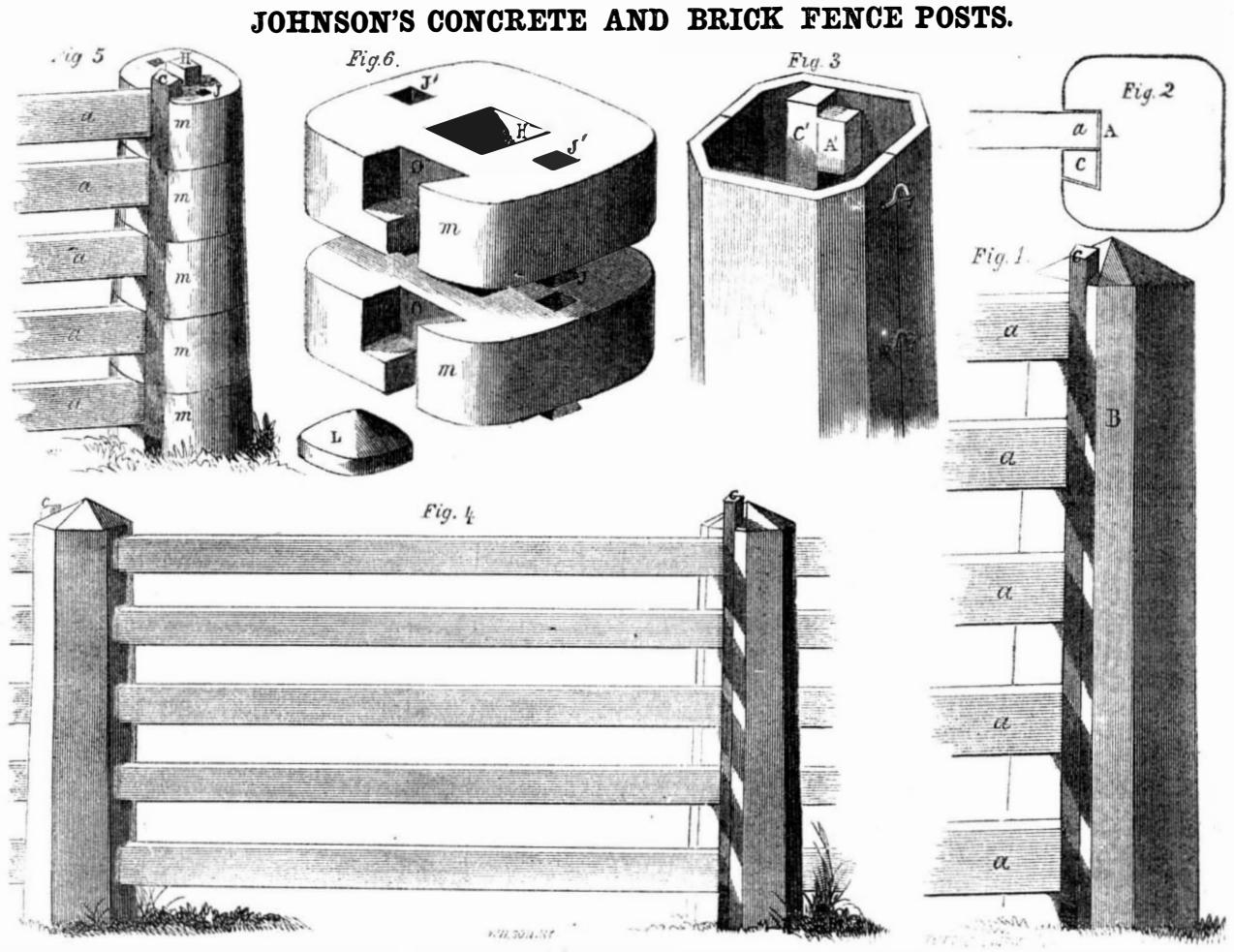
Speed of Electricity.

Some early experiments on the velocity of electricity in high tension led to the assumption of an almost inconceivably high speed as that always natural to the electric fluid. The experiments lately made to test the feasibility of the Atlantic Telegraph indicate about 1000 miles per second as the average velocity. It has also been proved that several waves of electricity may be travelling on the same wire at one time, a fact which will tend greatly to acilitate the rapid working of the great telegraph. In one case where the ends of 1020 miles of wire were brought near together, and a succession of shocks produced, three signals of a signal stroke bell were distinctly heard after the hand had ceased to transmit.

The Pacific Railroad.

In reference to the construction of the Pacific Railroad several favorable circumstances have occurred. The new President (Mr. Buchanan) has recommended it in his Message, and found constitutional authority for it. The examinations for water, made under the direction of Captain Humphreys, of the Topographical Corps, have proved successful —water in abundance is found at various depths.—*Railroad Record.*

JOHNSON'S CONCRETE AND BRICK FENCE POSTS.



Mr. Frank G. Johnson, of Brooklyn, this State, patented on the 27th of January last, a method of constructing fence posts, of which the following, condensed principally from his specification, is a pretty full description:—

The post may be built up solid on the spot it is to occupy, by filling the material into a suitable case, and allowing the case to remain until the post has become tolerably hard, or it may be built up of bricks previously baked in the ordinary manner; but in either case the invention employs material almost indestructible.

Fig. 1, a perspective view of a lime and gravel post, with the rails keyed in. Fig. 2, transverse section of the post; C, the key; *a*, a rail. Fig. 3, case or mold made in two parts, and held together by hooks. Fig. 4, perpective view of a length of fence. Fig. 5, perspective view of a brick post. Fig. 6, perspective view of two of the bricks separated from each other; L, the top or cap brick.

The object of this invention consists in providing for common use and field purposes, a cheap, simple and durable fence, composed of such materials as are generally available, and so constructed that any person may use it. It is now generally known that lime, gravel and cobble stones, properly mixed together in the form of mortar, and shoveled into suitable cases or molds and allowed to set or become somewhat hardened before the cases are removed, constitute a substantial and permanent wall; suitable even for building purposes, and which becomes harder and harder the longer it stands. The many dwelling-house and other buildings recently made, the walls of which are thus composed and constructed, demonstrate the practicability of employing these materials in a similar manner for the construction of posts in making fences.

The nature of the invention consists in composing the posts of fences of the materials, and in the manner above described, and in providing convenient and suitable means of inserting and keying the rails into posts thus made after they become hardened. The nature of the invention further consists in attaching or fastening the rails to the posts in such a manner as to enable one to employ in the construction of posts, suitably formed brick and mortar as well as gravel and lime, and in constructing the brick in such shape that they will form the post by laying up a single tier of the brick one above another.

To enable any person to make and use his invention, he thus describes its construction:—

Provide suitable case or mold, fig. 3, made of boards or plank open at both ends, the base of which is set below the reach of frost, and into which is shoveled the mixture or mortar of gravel and lime. Upon two of the opposite sides of the interior of this case or mold are suitable projections, tenons or ribs, A′, to form sockets or mortises or grooves, A, fig. 2, into which (after the post, B, has become sufficiently hardened and the mold removed) the ends of the rails, *a a a a*, are to be inserted.

Also place in suitable position within the mold a longitudinal strip or core, C′, of such shape that it cannot be removed from the post after it (the post) has set, except it be drawn from the top of the post. The object of this core is to form or leave a passage down through the post, into which is inserted a strip of wood, C C C, figs. 1, 2 and 4, which is similar in form to the core, and which passes down from rail to rail, and forms one side of each mortise, for the purpose of forming a permanent key or lock to confine the rails in their proper position, after they are once placed in the post, which lock or key at any time may be drawn to remove the rails It is not generally necessary to have the key or lock only at one extremity of the rails, the other end of the rails first being inserted into ordinary plain mortises. The exact form of the key or lock is not essential. It may be round, oval, angular, or provided it cannot be removed from the post except by drawing it out from the top.

In order to employ this method of attaching the rails to the posts, and at the same time to construct the body of the post with clay or brick, first form or shape the brick, fig. 6, like the transverse section of the required post, the thickness of each one to be equal to the distance between the rails, fig. 5, and all the brick to have a common slot on one side to receive the pin or key, C, that holds the rails in place, and also an offset mortise or notch (O, fig. 6) from the key to receive the rails. These brick are to be laid up with a little common mortar between them. To give the post a greater lateral strength, provide on the lower side of each brick a pair of tenons, J J, which are dovetail shape or larger at the end; and on the upper side of each brick make a pair of mortises, J′ J′, which are larger at the bottom than at the top, and so large at the entrance as to receive the tenons. Now, by filling these mortises with mortar before the tenons enter, the mortar, by hardening, will firmly key or dovetail one brick to another. To prevent the brick from cracking while drying or seasoning, and as well to give the post still greater lateral strength, mold them with a square hole, (H′, fig. 6) of considerable size through the center; and when the brick are laid up into a post, fill the interior of the post with mortar, or with a bar of wood (H, fig. 5) similar in size and shape to the cavity formed by the hole in the brick. To give the post any desired taper, give each brick its proper diameter and a common slope or taper.

By means of these methods of making posts they may be made of any desired shape—uniform and sawed stuff may be used for rails—it is impossible for any animal to displace the rails, and it obviates the necessity of renewing the post every few years.

Mr. J. does not claim the employment of the mixture of lime gravel and cobble stones in making posts, nor the mold or case in which to form the posts; but what he does claim is the post B, formed and constructed as described in combination with the keys, C, and rails, *a a*, as described.

Further information can be had by addressing the inventor.

Literary Notices.

How to Write:—A New Pocket Manual of Composition and Letter-Writing, intended for a class of young people and others, who are not satisfied with the puerile and trashy works so common under the general title of Letter-Writers, who do not desire to be saved from the necessity of study and thought, but who will be grateful for a little guidance in their studies, and for such instructions as will aid them to think for themselves, and to express their thoughts in fitting words. It is a good work, and should be possessed by all who are unused to writing letters. Price, in paper, 30 cts., muslin, 50 cts. Published by Fowler and Wells, 308 Broadway, N. Y.

The Bay Path: a Tale of New England Colonial Life.—By J. G. Holland, author of the History of Western Massachusetts, etc New York: G. P. Putnam & Co., Publishers. Dr Holland has long been connected with the Springfield Republican as one of its editors, and occupies, as he well deserves to do, a conspicuous position among the able writers at present connected with the Massachusetts Press. The volume before us adds to his good reputation. It is written in an easy flowing style, evinces nice discrimination in descriptions of character and scenes, and, on the whole, forms a most agreeable book, suggested by the rugged story of New England Colonial Life. The work contains 418 pages. It will have an extensive sale among the descendants of the Pilgrim Fathers, who are widely scattered all over our country.

Villas and Cottages: a Series of Designs prepared for execution in the United States. By Calvert Vaux, architect.—Published by Harper & Brothers, New York. The author of this beautiful work, Mr. Vaux, was associated as partner with the late lamented Downing, whose name is familiar to the whole country as one of the most gifted and genial men of our time. Mr Vaux has nobly brought forward in this volume many of the best architectural designs of Downing and others, and has made up a volume at once beautiful and highly valuable, not only to architects, but to all who desire to cultivate a refined taste for this branch of science. The book contains over 300 pages, and 300 engravings, illustrating dwellings costing from $1,500 to $50,000. The descriptions are practical, and the criticisms are judicious and very instructive On the whole, it is an excellent work, and is published in the best style of the celebrated firm of Harper & Brothers. The price is only $2.

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